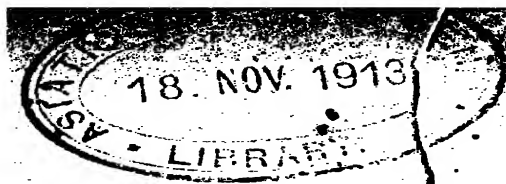


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EDUCATIONAL SERIES
No. VII.

THE DEMONSTRATION
SCHOOL RECORD
No. II.



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PLATE I.

Some of the Kindergarten Class engaged on various apparatus, Montessori and others (see page 45). The seats at the back are for the use of students who attend Demonstration or Open Lessons—at present no room is provided for this purpose, and the Kindergarten has to serve a double purpose. The doll was made and stuffed by children a year older, this and other articles form an early stage in the art of reading. The names attached to its cradle and bedding by children 8 years old, and they were presented to the Kindergarten.

THE
DEMONSTRATION
SCHOOL RECORD No. II.

THE PURSUITS OF THE FIELDEN SCHOOL

EDITED BY

J. J. FINDLAY, M.A., PH.D.

Sarah Fielden Professor of Education

MANCHESTER

AT THE UNIVERSITY PRESS

1913

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No. LXXV.

THIS VOLUME IS
DEDICATED
TO
ALFRED T. BENTLEY, M.A.
A TRUSTEE OF THE FIELDEN SCHOOL AND THE
FIRST CHAIRMAN OF ITS COMMITTEE
AS A SLIGHT ACKNOWLEDGMENT
OF THE
DEVOTED SERVICES
HE HAS RENDERED TO THE
DEPARTMENT OF EDUCATION
IN THIS UNIVERSITY.

PREFACE.

This volume, as its title indicates, is a record of work done in connection with the Fielden Demonstration School, and is the second in a series which was begun in 1908. The first volume was less ambitious than the one now published: our main purpose in those pages was to explain what a Demonstration School stood for, and its special function amid the complex educational machinery of a modern community. Some contributions on curricula and method were included as examples of the way in which staff and students work at pedagogic problems, but these only covered a small part of the ground. During the years that have elapsed, a Seminar has been organized which combines the staff of the Fielden School with University Lecturers and Demonstrators in Education. The papers, reports and discussions of this class are all directed to improve the work of the School, assimilating the principles expounded in University Lectures with the daily pursuits of the scholars. Some of these principles were embodied in my contribution to "Outlines of Educational Courses," issued in 1910 by our University Press; now we revert to the practical side and have prepared a series of chapters which display in as much detail as space will permit the daily programme of the school. Most of these chapters, with others which have not been reproduced, have been read in the Seminar during the last session. My task as editor has been to select for publication what appears likely to be most serviceable, not only to our own students, but to a wider circle of teachers, and to bring the set of contributions into line, so as to achieve, as far as may be, a united scheme. These contributions, from Chapter III. onwards, comprise the bulk of the book. They are prefaced by a paper of a general character on *Work*, which deals with a theme, not only of engrossing interest to teachers at the present time, but touches at many points the practice expounded in the subsequent chapters, and by an account of Corporate Life and Management

which will help the reader to realise the sort of community which engages in these pursuits.

It will be readily perceived that this enterprise, extending over four years, has been shaped by many hands. We have learned continually from each other: plans are proposed, and challenged; sometimes accepted and tried, sometimes rejected. Those who see most clearly how to carry out an idea are sometimes least able, from lack of experience in exposition, to make its basis clear to others. Colleagues come and go; often without knowing it colleagues imbibe one another's ideas and practice, which may take shape later on as fully-armed theory. Hence we whose names appear as responsible contributors gladly acknowledge the benefit gained from the views and criticism of colleagues, past and present; in a few cases it is possible to make a definite acknowledgment (see Chapters II., VIII., XII., XIII., XIV.), but it is impossible to indicate the full range of our obligation either to those there mentioned or to others, whether in the University or on the school staff, who have put their experience at our disposal. Prolonged studies in curriculum can indeed only be pursued by means of continuous exchange and criticism; the difficulties encountered by adjusting views can and are overcome when the value of co-operation is realised.

I dwell upon this point because it is of capital importance as regards pedagogic investigation. In other realms of science a man can do much of his research in complete isolation; in the study of curricula and Corporate Life the case is otherwise. For successful investigation we must secure not only the *Lehrfreiheit*, which is due to University teachers, but the time and patience to develop and watch results and the self-denying co-operation of a number of workers imbued with the spirit of investigation. These three conditions have been fulfilled. There is a fourth condition, viz., sufficient material and support, in salaries and equipment. Here we can only wait upon events to extend the generous endowments of our founder and the assistance secured, through the medium of the University, from State funds. If the publication of this volume proves to a wider circle that our efforts are worth while,

those who hold the purse strings will, in due course, smooth the path. New lines and methods of research are always, in their early stages, regarded with suspicion. Wisdom is justified of all her children, but sometimes the verdict is delayed. If these lines of investigation are to develop in our Universities in days to come, they will need funds not so much for apparatus and buildings as for scholarships for a few gifted young teachers, to enable them to take up work in a Demonstration School without anxieties for board and lodging. Only thus can a new generation be trained to carry forward the endeavours of the pioneers.

Acknowledgment should further be expressed:—to Miss Rankine Brown for much help in collecting material, in addition to her share as a contributor; to Mr. E. Quine, of the Department of Education, for the index and for other help in preparing the volume for press; last, but not least, to Mr. McKechnie, the Secretary of the University Press, for his patient and careful supervision.

J. J. FINDLAY.

The University, Manchester,
28th February, 1913.

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2. The conflict between adult logic and child psychology. Reform encouraged by the Board of Education. Axioms and postulates to be assumed, but not discussed: certain propositions also to be accepted, but not "proved."
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A RECORD OF THREE MONTHS' WORK IN THE
FIELDEN SCHOOL KINDERGARTEN WITH MON-
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Miss K. Steel and J. J. Findlay.

Apparatus classified in three groups: (a) Educative Toys: the theory of their purpose. The special advantage of blindfolding children. Apparatus devised additional to that in the system. Difficulties in apparatus for sound, taste, smell. (b) Occupations involving a social purpose. Immediate practical value of the Frames. But extra Frames needed for English boys. Domestic Activities also practised by the Froebelians. (c) Exercises in Language and Number. These can be commenced at an early age, if kept at the level of play. Rapid progress in number with suitable apparatus (dominoes, envelopes, etc.)

Principles at issue. (1) Freedom *versus* discipline: absolute freedom may lead either to licence or to arrest of development. The nature of this freedom defined. Success in the Fielden School Kindergarten. (2) The meaning of "Sense-Training." We are not training special senses with a view to dexterity, but we are helping the scholar to master his environment at his present level more adequately. (3) The Time Table. The English school day is short, and we are not prepared to sacrifice the whole day to these employments. Why should not the help of the home and nursery be enlisted? A skilled teacher can shew parents and governesses how to supervise the little ones in the nursery: and elder scholars can also be attracted to help their little brothers and sisters. (4) Objections to imposing a rigid patented system on teachers. If children are to be free and resourceful, teachers must themselves be allowed freedom, and cultivate a liberal spirit. A "Warning" from *The House of Childhood*, New York. At the present stage teachers should investigate the new doctrine, but it should not be imposed without experiment and adaptation 263—276

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INTRODUCTION.

Critics of a cautious temperament, on examining one or other of these chapters, may be distrustful of some of the proposals, for no doubt much that we here advance is foreign to the practice of the older generation of teachers. To such a stricture we can reply in two ways. First of all, this school is achieving the regular purposes of a school education up to fifteen years of age, and evidence is forthcoming that the results are satisfactory. Our aims forbid us to enter the scholars for external examinations of any kind, and we draw them from families which commonly do not ask for such preparation (see p. 42 for a list of classes). A few scholars before they have completed the course are selected by their parents for some profession which presupposes a distinctly "secondary" training with an appropriate Leaving Examination. In such cases the parents are advised to withdraw the scholar, although in some cases this transfer to a secondary school does not take place until the VIIIth Class has been reached. Nevertheless a few of the seniors enter for tests of the kind and achieve success. This summer, for example, the list includes two scholarships at secondary schools, a competitive examination for entrance to a Bank, and the Chartered Accountants' Preliminary. The fact is that all good schools secure such successes when required, not by copying the arts of the crammer, but by steady attention to the elements of a liberal education in general. In any event it is time enough to think about such tests when the scholar approaches to within a few weeks of the stated time for an examination. These schemes of study necessarily say little of the time devoted to practice and drill, but visitors who examine the exercise books and other evidences of progress will see that habits are being formed among our scholars as in other schools in the ordinary branches. What is said below (pp. 12 to 18) on Management, shows that we look for results in good order and accuracy as well as in intelligence and initiative.

But, secondly, our distinctive purpose is to investigate proposals which are new, otherwise there would be no object either in maintaining the school or in presenting this volume. Prescriptions twenty years old are as useless to the school-master (unless they are revised and re-tested) as to the ship-builder or the physician. We do not profess adherence to any party of innovators or reformers, but we are conscious of the unrest that prevails, both within the teaching profession and outside, as regards the results of schooling. Hence we treat the traditional methods as being as much subject to challenge as the latest method which the reformer proclaims for a new gospel. The task of reconciling the eternal conflict between reverence for tradition and devotion to truth is no doubt harder for the teacher than for his confrères in other professions, but it is still more urgent, for he works on living material which, by its very nature, is destined to reshape the world.¹

Thus we present the volume neither as a compendium of school practice nor as a model for imitation, but as an example of the way in which teachers, charged with the double responsibility of instructing students and of educating children, seek to avail themselves of the advances made in educational science. We often find it necessary to caution our students on this point, for they work in other schools as well as this, and are naturally inclined to question whether plans in the Fielden School can or should be adopted elsewhere. To us the inquiry does not seem very important. Each school has its own aims, its own staff, its own limitations, and these condition the detail of its practice. What is important is to recognise the large principles which underlie this syllabus and which the daily progress of school should exhibit, so far as human infirmity will permit.

Some of these principles are concisely outlined in the prefatory notes attached to the various sections of the syllabus. These are necessarily based upon research in two directions: on the one hand, to secure a better understanding of the child's mind, and, on the other hand, over against the child, to revise

¹Space does not permit an extension of this argument. The writer of this chapter may be permitted to refer to chapters iv. and viii. in *The School* (Home University Library), where the meaning of "freedom," both for scholars and teacher, is more fully treated.

our adult conceptions of the meaning and value of the curriculum, embracing under this term the varied realms of experience which constitute the life of man. In this second field the reader will find many indications throughout the volume. The meaning and purpose of History, Geography, Literature, Art, Science are each turned over and examined.

Upon the first (Child Psychology) a few words may here be added, since psychology itself is being so rapidly reshaped. With every decade new discoveries are being made, and our changing conceptions of schooling will be more and more governed by contributions from mental science.

As regards the evolution of the intellectual life, we by no means discard those doctrines of Interest and Apperception which it was the chief distinction of the Herbartians to have applied to the business of the classroom. But we find it more and more difficult to treat the intellectual life as if it were a thing apart, as the Herbartians are prone to do. The new psychology, which lays emphasis upon the motor, active side of experience, carries schoolroom practice into regions wholly foreign to the pedagogy of an earlier generation, and is operating in at least three directions. Firstly, it has given a scientific interpretation to the world-wide movement which supports Manual Training, or, as we prefer to name it, Handicraft; secondly, it has helped to explain the mode in which skill is acquired, not only in Handicraft as usually understood, but in all exercises where practice is demanded. The Course in French (see p. 158), equally with the scheme in Handwriting (p. 119), illustrates our dependence upon the psychology of habit, of attention and of acquired automatism; finally, it has given a deeper meaning to that doctrine of purpose or aim, which, with the Herbartians, often resulted in artificial endeavours to point an aim (*Ziel des Unterrichts*) for interests which were merely schoolroom interests. As expounded by a great master in psychology, such as Dewey,² this doctrine plays a leading part in the entire syllabus, as may be seen in many of the pages that follow.

¹ See Dewey, *The School and the Child*, pp. 18-47, for a most valuable exposition of the double task laid upon the investigator.

² See, e.g., Dewey's *How We Think*, chap. iv.

No less significant of change in the new psychology is the recognition of the social consciousness as an eminent factor in the development of the individual mind. English schoolmasters, since the days of Arnold of Rugby, have been seldom neglectful of the communistic aspect of the educative process, but it is only of late that empirical methods have received interpretation and criticism from the psychologist. Work such as that embodied in Macdougall's *Social Psychology* is destined to affect not only the out-of-school life of the child, to which we refer in Chapter I., but to reshape, sooner or later, the procedure of the classroom. Anyone who studies the account in Chapter VI. will see that the instruction there undertaken is, from start to finish, a social, co-operative affair. The teacher's rôle is changed. He serves as a guide and counsellor, but his scholars to all appearance are not only displaying individuality, *i.e.*, initiative and resource, they are combining, giving and taking from each other, governing and being governed—displaying, in fact, all the phenomena of a social body, which the expert in social psychology is beginning to investigate on the teacher's behalf.

But we have to rely on psychology in a field of even greater complexity. Our plans, as exposed in this succession of chapters, deal with "the scholar" as engaged during each year in a variety of pursuits which have established relations with each other, and with him at a given time or date in his unfolding life. Thus the reader may select the age of ten and make a cross-section, so to speak, from the entire plan, shewing how the school day of a scholar at this age will be absorbed. But what evidence have we that this arrangement suits the average age of ten rather than eight or twelve? What help can Genetic Psychology give us to determine the nature of the reaction which, stage by stage, the subject will display to the object? It is at this point, more than at any other, that psychologist and teacher have to rely upon each other. Every school syllabus assumes an order of development, whether or no the teacher who frames it has put his view into words.

As a working hypothesis some of us engaged on this volume have found in Stanley Hall's division of stages a serviceable

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guide,¹ but it is too early in the day for anyone to adopt a dogmatic attitude in distributing child-life into stages.

Much as we have benefited by the research hitherto accomplished by Genetic Psychology we feel the lack of accurate results, and hence we endeavour to keep records as described in Chapter I. so as to make, if possible, some contribution to future investigations. Only after conducting studies of individual cases extending over many years can the psychologist hope to come to our aid in this, the one branch of his science which is indispensable to the teacher. Meanwhile these pages bear evidence that we make the most of the limited knowledge at our disposal.

Prominence is necessarily given in this volume to the successive development of impulses and instincts. In the old days almost the only instincts that found free scope in the school were associated with submission and with intellectual curiosity, but modern advances in pedagogy demand freedom *for development on every side of child nature*. Hence we admit the claim of the young to "freedom" so that the native instincts may find scope; but we also see that the purpose of the species depends upon the due inhibition of instincts. The school is one of the chief agents organised by modern communities to establish conventional occupations and interests which shall restrict licence. Thus in such a school as this we are all along engaged in an inquiry which may be summarised as an examination and re-examination, under many conditions, of our scholars' behaviour, so as to determine more exactly the trend of these instincts or impulses. The accumulation of such concrete material as the years of child-life succeed each other is a task preliminary to any full account of the stages of development. If we were asked to state what is the main object, in the realm of pure science, of the investigations conducted at the Fielden School we should probably find the answer centring round this question. In every class the scholars' natures, as individual and as a group, are being noted and defined, exhibiting this or that reaction or mental quality; and this in contrast both to the class above them and to the

¹See chap. v. in *The School*, *loc. cit.*

class below them. The interpretation of phenomena frequently baffles the observer, but the plan of pursuits presented in these chapters is the outcome of countless observations and conclusions made in contact with the scholars. More or less consciously every syllabus here published is an application of Genetic Psychology.

Among other problems of child-development those concerned with morals are by no means the easiest to solve, especially as they touch so nearly our adult and personal views of behaviour. The absence of any direct references to morals in these chapters should not mislead the reader to suppose that personal conduct or the formation of ideals in the young is regarded by the writers with indifference. Our space is limited, and we cannot attempt in one volume to expose a complete theory of the curriculum.¹ One factor at any rate in the development of the moral life must be admitted as valuable, viz., the progressive revelation in the young of a larger experience: a continual expansion, at once intellectual, emotional and practical. This is the basis, the mental stuff out of which behaviour will spring; and if a scheme of school pursuits provides this in worthy fashion, it has discharged what is perhaps its chief office as regards the formation of character.

We designedly omit from these pages some grave questions which we are aware cause increasing anxiety to men and women as the public conscience becomes awakened more and more to the influence for good or evil which schooling may exercise. Some of these are concerned with religious experience, a realm of controversy on which we do not feel entitled to trespass: problems of social change relating to the political and social order fall within the same category. Other fields of personal and public morals, *e.g.*, gambling, temperance, sex-hygiene, find no reference here, although we certainly do not deny their importance, or depreciate the efforts of those who venture on these difficult and obscure regions of pedagogy. Apart from direct instruction, much is gained in strengthening self-control by what Dr. Chalmers used to call "the expulsive

¹ While these chapters are passing through the press one of the staff is investigating the syllabus of Bible Teaching. We may hope to treat of this theme in a later volume.

power of a new affection," that is, by positively enriching the experience of the young with images of what is fair and noble. But within these prescribed limits we are seeking to make the psychology and the ethics of this generation a vital force in the minds of students by tracing their operations in the daily business of this school.

Apart from their function as places of instruction, our universities in these days have assumed the office of a middle-man, an intermediary. Every generation witnesses profound changes not only in art and science, but in philosophy and the view of life; and the University undertakes the task of relating these changes to men's practice in every field of activity—not only in medicine, or engineering, or law, but even in commerce and politics. We are bold enough to attempt the same task as regards schooling. Whatever of failure there may be in the achievement, it is something at least to have discerned the goal.¹

REFERENCES.

On page 5 of *D.S.R.*, I., will be found particulars of a new publication with aims similar to those here professed. To these we may add a volume recently issued by the London University Training College containing scheme of Curricula for Demonstration Schools. This was privately printed by the L.C.C. Education Committee, 1910. References to a number of "New Schools" and Experimental Schools will be found in an article contributed by the present writer to the *Cyclopædia of Education*, Vol. II.

¹Compare Dewey, *School and Child*, pp. 104-6, as to the function of a University Department of Education; also Rein, *Encycl. Pädagogik*, vol. ix., pp. 336, 337.

THE DEMONSTRATION
SCHOOL RECORD
No. II.

PART I.

GENERAL ESSAYS.

CHAPTER I.

CORPORATE LIFE, WITH SOME NOTES ON SCHOOL MANAGEMENT.

1. The Fielden School (apart from teachers, students, demonstrators) provides for some 180 scholars ranging in age from 4 to 15. Now, in a sense, all the scholars feel their comradeship (which their school colours symbolise) as belonging to one community, and this common bond is strengthened both by the interest which parents take in the entire school, and by the unity of purpose which is felt by the staff as students of child-development. But the child himself cannot be expected to share this breadth of interest.¹ Thus an experiment was recently tried of setting Class IV. to write a play for the class below on themes with which the former had become familiar in the months preceding; Class IV. were quite glad to prepare the play, but Class III. were by no means pleased to accept the work from their seniors.

Hence a community embracing so many stages of development needs to be subdivided—not only into classes, each representing a year of school life, but into societies of larger extent. We have two of these, an Upper Department (Classes IV. to VIII.) and a Primary Department (from the Kindergarten to Class III.), each with a senior master or mistress who exercises special tutorial responsibilities. The Primary Department again shews marked diversity of social life; the little ones of six and under are widely divided in sympathy from their elders of eight and nine. The entire school is under the management of the Superintendent, who as the executive officer of the Committee ensures the co-operation of a united staff in all matters relating to scholars. This general principle of organisation, combining unity with diversity, is characteristic

¹ There are exceptions to be noticed. Girls of 14 and upwards are ready to care for little ones. Once and again a girl from Class VIII. has responded with pleasure to an invitation to spend a morning in the Kindergarten.

of all schools where the proper rôle of corporate life is recognised. The particular divisions here adopted are those which at the present time seem best fitted to meet our needs.

2. Now, corporate life, as distinguished from teaching,¹ is the expression of the social spirit by the members of a society on their own behalf; scholars are here free to display their own tendencies. Hence we are not at pains to systematise too carefully the out-of-school activities of these young folk. By the goodwill of the Committee and of parents, who found means to level our playfield, we can offer a pleasant field for games, and the teachers, most of them young in years, freely give their time to help in such recreations; but there is no compulsion. The boys have all along shewn the usual keenness in field sports, and of late the elder girls have shewn equal keenness in playing cricket. Other more sporadic efforts at combination appear and disappear from time to time. Corporate adventure, leadership and its counterpart—submission—assume varied shapes.

The device of Unallotted Periods in the School Time Table, which we owe to Scott's *Social Education*,² is being tried with some hope. In these periods (one or more per week) the members of a class are allowed to occupy themselves as they please, so long as they keep within the school grounds and occupy themselves seriously with some continuous enterprise. The principle here seems to be that of freedom. Assuming that the experiences of school are rich in suggestion, we believe that these young people will gain by having a control of a small portion of their time. In general terms everyone knows that the young are full of projects which they will pursue for a time with great ardour,³ and that by means of this rapid progress can often be attained. Now, a curriculum devised by adults to occupy the entire life (often with the most praiseworthy intentions on the teacher's part) may defeat the larger purposes of education by preventing the

¹The distinction must, of course, not be pressed too far. Indeed, the best teachers are always striving to "socialise the curriculum." (Dewey, *School and Child*, p. 111.)

²See p. 24.

³The classic example in pedagogic literature can be read in Stanley Hall, *Aspects of Child Life* ("Story of a Sand Pile," etc.).

chance of initiative and of social combination. A German schoolmaster recently spent a day in the Fielden School, and at the close summed up his impressions by saying: "This is not a school; it is a family." Now, nothing has been further from our thought than to copy family relationships in the organisation of the Fielden School community; but our visitor's verdict was due, one feels sure, to the air of self-sustained activity which our scholars seem to assume, without any cultivation on our part; and this sort of independence is not unlike the ways of an industrious family circle.

3. *The Boys' Scout Troop*.—This same principle of freedom, tempered with oversight, appears to be one of the main benefits afforded by the Boy Scouts system, to which, in common with many other schools, we are giving a trial. True, this scheme, marvellously devised by Baden-Powell, demands leadership from older folk (and boys are quite ready to follow a leader); but, so far as schoolboys are concerned, it loses much of its value unless the members of a Scout Troop are compelled to rely upon themselves.¹ There has been no pressure to join the troop, and the accident that the two Assistant Scoutmasters are University men (one of them an Old Boy of the school) who have no other duties in the place is an advantage so far as it helps the Scouts to feel their membership in a club apart from the official routine of the school life. At first it was feared that scouting would interfere unduly with sports, but hitherto this has not been the case, and care is taken that Scoutmasters discharge their functions in due subordination to the school authorities.

The relation of the Scout movement to English schools is one of growing importance, and merits fuller handling than we can give it in these pages. The large majority of troops in England are at present made up of boys who have left school and lack other social organisation, except it may be of a religious kind. But schoolboys already belong to an active social body, and the introduction of a new "club" into the school community has to be justified. We think a good case is made out; at the same time it is clear that the system will

¹ We have glanced elsewhere (p. 35) at the training given in money matters by the getting and spending involved in the expense of a troop.

need adaptation to the special situation of schoolboys, as distinguished from lads whose school days are over. Two points seem to be fairly clear—first, if the school, with its traditional methods of directing and managing boys, takes up Scouting as a new “subject” regulated in detail by a staff, its special qualities in the development of initiative, will be imperilled. But, on the other hand, the national organisation, with its elaborate system of District Associations, united Rallies, and multiplied competitions, may be awkward to adapt to the quieter and more absorbed life of a school community. What may be necessary as stimulus to Scouts and Scoutmasters who have no concern with school-life may be a hindrance to sound growth in a troop composed of members of one school. Those who control the movement are, however, themselves so infused with the spirit of freedom, plus discipline, that we need not fear any difficulty in securing the needful compromise. And, so far, the benefit of the movement to teachers, is at least as great as to the boys; for we are finding how much can be learned by boys (quite apart from the training in initiative) in Handicrafts, in First Aid and the like, as a supplement to the regular programme of the school day.

Scouting and other forms of combination are thus seen to play their part with children above ten years of age—increasingly so after twelve. Before this period of life there is little evidence of such instincts; little children are glad to have playmates, and on the plane of imitation are ready to act the life of their elders, but their more immediate practical needs are satisfied with social combinations of a fluid type; teachers err if they appeal to the little ones for the premature expression of social sentiment.

4. *Social Life of School Girls.*—Some preliminary studies have been made in the Seminar of methods in vogue in various schools which foster out-of-school activities, and these are being investigated in relation to the disposition and tastes shewn by our own girl scholars. It may be here noted that in the Upper Department one of the mistresses is charged with tutorial oversight over the girls, in addition to the general responsibility placed on the senior master.

We have not thought it wise to try and copy the Boys' Scout plan by inviting our girls to organise as Girl Guides; it is at least doubtful whether such imitation is psychologically sound. Merely to ape the boys' troop would be absurd. We have sufficient examples in all types of schools of the follies committed by both men and women in seeking to copy for one sex conventions and schemes devised for the other. Since we began in 1908 to conduct the Upper Department as a mixed school we have had ample opportunity to note the points where boys and girls diverge out of school hours. The school premises are open to both alike—garden walks, lawns, playground are not partitioned between the two; if the boys and girls wanted they could have played together, but after the age of eight or thereabouts they tend to go apart. The severance is not due so much to social suggestion as to difference in choice of recreations; the girl, with her physical and mental make-up, wants different amusements from the boy with his make-up.

It is quite established that girls after the age of twelve (and often long before that age) seek a social combination apart from boys, even if separation were not encouraged by family or social tradition. Further study seems required; study, that is, of the free social activities of girls at these ages, to determine how best to assist them in social self-directed efforts.

5. *School in the Country* (some 15 miles from Manchester).—A little light has been thrown on the question by an experiment we have made in taking scholars into the country for short periods. In the early days of the school¹ similar experiments were made during three successive years, but in renewing the attempt this year we provided a cottage, which was placed at the disposal of scholars both for week-ends and for use by two classes at a time from a Monday to a Saturday. Money was subscribed for furniture, and, in addition, two tents were forthcoming. Girls and mistresses and women students were housed in the cottage; boys, masters and men students in bell-tents. Some of the meals, as well as the instruction and oversight, were taken together. Our hope has been that this might result in a permanent country home for the school, but although this

¹See *D.S.R.*, No. 1, pp. 79-84.

has not been yet attained, the experience has been of great value. All that was reported in 1906-8 has been found true again, and it is gratifying to find from former students how the idea of transporting scholars to the country is being taken up in other schools. Thus the quarters at Great Hucklow, which we used in 1907 and 1908, have been used for a week this summer by a Secondary School under the guidance of a schoolmaster who was formerly a student in the Department.

Our boys certainly learned much in a short time while living in tents, not only in initiative and social experience but in positive knowledge; they displayed varied interests both of an intellectual and æsthetic kind, and it was gratifying to find that, in spite of the demands made upon their time by the domestic duties of camp life, time was also found to a surprising extent for out-of-door work in Nature study and Geography. If only the expense to parents could be lessened, or if parents could be led to see that a short period of country life is an invaluable means of development (and not merely a holiday) this type of education could be organised to a high level of excellency.

Our experience is not extensive enough to pronounce clearly as to differences between girls and boys in relation to these activities, but it seems fairly clear that girls do not commonly appreciate going from home to pursue domestic activities. The girls of our school are probably not burdened at home with much household work; the mothers undoubtedly spend themselves in domestic interests without asking much from their daughters, and yet (after ten or eleven years of age) the girls seem to revolt against dusting or scrubbing, or even cooking. Probably the very fact that public opinion still looks to women to care for "Hearth and Home" gives to some adolescent girls on the psychological principle of contrariance, a bias against such activities. It has been suggested that if girls, with their teachers, were allowed to camp either in tents or in wooden sheds or barns, escaping, as do the boys, from the ordinary domestic routine, with a minimum of scrubbing and polishing, they might be more willing to relinquish for a time the pleasures of town environment.

Certain we are (and this experiment renews the conviction) that all plans for taking children to the country should be based not only on a "simple" way of living, with plain food and hardy conditions, but should dispense with hired service, and lead the scholars, whether boys or girls, to realise in their own persons the conditions under which food and cleanliness and shelter have to be provided by mankind. Such lessons are of inestimable value to the rising generation in every rank of society. Camping or trekking as Boy Scouts is only one way of learning such lessons. We hope to investigate the problem further. The rational instincts of both boys and girls need to find scope in the freedom of nature, and the special distastes shown by girls can probably be met by a closer study of these influences which affect their tastes.

One incidental result of this experiment may be noticed—in the opportunity afforded to teachers and students for a more intimate knowledge of their scholars. This personal knowledge is becoming more and more urgent in these days because the school is expected, and rightly, to diagnose individual disposition, if only to help parents in choosing a vocation. For some boys (and girls too) city life is irksome, and the varied occupations of the country may provide a more wholesome career. We have already had one boy who, as the result of camping, has, at his own request, been placed with a farmer to work during the summer vacation. Normal boys and girls are active and do not need six weeks' idleness in the finest weather of the year. If we train them to freedom and initiative in the fresh air they will themselves point the way to solutions of the summer holiday problem.

Parents.—Let us now turn to the relations of the school society, to those who stand, as we say, on the fringe of our community. We reported fully in 1908 (*D.S.R.*, No. J.) on the relations established with the body of parents, and need only add that these have been deepened in the ensuing years. And it is gratifying to find how, year by year, schools of various types are cultivating relations similar to those which obtain here. For the parent stands in a special relation to the school, not as setting aside the larger purposes for which schools are

founded, but as safeguarding, so far as that be needful, the distinctive needs of his own child.

In other schools it is the public interest as represented by various "authorities" that may run counter to the individualism of the family; the final purpose of this school is to train students and to demonstrate for University purposes. All the more reason, therefore, why we should be considerate of parental views. In practice we find them very ready to co-operate and very appreciative of the personal interest we take in their children; they soon realise that the work we do with students and in the Seminar reacts on the daily programme of the school.

We have now for several years had the pleasure of meeting the parents at our stated gatherings during the winter terms, and every year increases our conviction that the stability of a school community depends materially upon fostering these sensible relationships between teacher and parent. It is singular how mistaken the public are as to the estimation in which parents hold a Demonstration or Practice school. Administrators unfamiliar with this field of education never fail to inquire of us whether we can secure children to attend, whether, *i.e.*, the parents will send their children "to be experimented upon." The impression of the outsider is that because in such a school much attention is paid to theoretic principles and because students are associated with the staff, that on this account the daily life of the scholars will be disorderly and irregular. But it is forgotten firstly that anyone who, like ourselves, undertakes such an enterprise would never do so unless he had much practical experience behind him; further, in choosing teachers we necessarily look for people who, although young, perhaps, and eager to study new methods, are practical in the best sense of the word; secondly, that we are so perpetually visited and so absolutely under the public gaze that unless we made a respectable shewing we should soon be found out.¹

We are not singular in this respect; all over the world where

¹ Readers who are especially interested are referred to *The Demonstration School: Its Aims, Methods, Results* (*Educational Times*, Nov., 1908).

such schools are conducted by Training Colleges they are well frequented and popular. With us there are obvious advantages in addition to those specified above. We have delightful grounds, affording fresh air and exercise; and we have small classes in which every scholar can receive individual attention. Parents appreciate these advantages, and with the very large population surrounding us on every side a selective process goes on, providing us with a group of families who are especially appreciative of the work we do for their children, and glad that these should be associated with a place dedicated by its very purpose to the cause of educational reform. The essence of this reform, so far as Corporate Life is concerned, lies in the feeling with which a scholar regards his school. Too often he is subconsciously brought up to regard it as a place where he can get something for his advantage—a vague something called education, which his parents pay for either by fees or through rates and taxes; the teacher has to dispense this article to him, and he (or his parents) have to see that they get their money's worth. But a better understanding of Corporate Life reveals his school to him as a society to which he gives, rather than a shop at which he buys. It claims (or, rather, without claiming, it secures) his ready devotion and service; and in this spirit young and old are alike willing to "work"¹ for it and in it—not for their own kudos or advantage, but for the common good. Whatever other educational theories may be here taught, this kind of socialism, based on the simple homely virtues of our common Christianity, is indispensable. And it pervades not only out-of-school activities, such as scouting and camping, but it spreads more and more into lessons and the entire time-table.

7. *Festivals* (the school and the world outside).—This social spirit may extend, although much more vaguely, beyond the family to larger communities with which the scholar, as his range expands, finds himself united. As the bond with the family is expressed in the Parents' Evening, so in many countries and in many types of schools special gatherings are held to give expression to patriotic or civic sentiment. We have hitherto done little in this direction beyond remembering the birthday of our founder. During Mrs. Fielden's lifetime the

¹ Compare p. 36.

school every year was mindful of that day,¹ and now that she has gone from us we should keep alive some memory of her services. A Founder's Day in any school is worth while as an exercise in piety, as well as a lesson in real history: as a means of uniting, once a year, all who contribute to the common welfare, not only scholars with teachers and student-teachers, but parents who give their children, together with governors and benefactors who give their time and money to enable it to achieve its aims.

In our Seminar we have agreed that celebrations of this kind can also properly take place to symbolise our relationship to our country. The King's birthday on the one hand and the commencement of the new civic year, on the other are suggested as affording suitable occasions. Imperial and Navy Leagues are active enough in seeking to stimulate the larger patriotism, but it seems equally necessary to cultivate in the young a sense of affection and of obligation as regards their own neighbourhood. In all such proceedings one caution has to be borne in mind:—the scholars themselves should play a leading part. Recitations, music, exhibitions should be arranged with their active co-operation as a part of their school studies, so that they may be intellectually influenced by the effort as well as emotionally stimulated at the moment. Such gatherings, to be successful, make it necessary for the school to be provided with a large room, not only for the scholars but their parents and friends. Our Fielden School building, which was formerly a private dwelling, has many advantages, but it does not contain a school-hall, and this deficiency, we hope, may soon be supplied, both for the benefit of the school and for the assemblage of University students at Demonstration lessons.

NOTES ON SCHOOL MANAGEMENT (UPPER DEPARTMENT).

8. *The Class Teacher and the Specialist.*—While for the general purposes of Corporate Life a school such as ours, with scholars ranging in age over ten years, needs some sub-division into two or more departments, it also needs for the ordinary sequence of school pursuits a division into classes, each arranged

¹A short biography of Mrs. Fielden was reproduced in *D.S.R.*, vol. I. See also *Encyclopædia of Education*, vol. II.

to pursue a syllabus for one year at a time. One teacher is especially allotted as class teacher to each class, but in planning the teachers' time-tables we endeavour to give (both for the scholars' and the teachers' benefit) some diversity, *i.e.*, we do not arrange for the same teacher to take charge of his or her class for the entire school-day; each teacher has some special qualifications, and these can be utilised in more than one class. In this respect we follow the system in vogue in secondary schools rather than that usual in elementary schools. At the same time we do not advocate the extreme policy of encouraging the teacher to be a pure "specialist." This policy is quite right in the University or in the highest Forms in Secondary Schools, but for the general need of schools we require teachers with wide and liberal interests, ready to appreciate their scholars' needs in every field of experience, ready to co-operate with colleagues whose specialism is different from their own, ready to continue their own culture by taking up new studies. They then rely on what they have learnt at the University, not so much for the positive knowledge gained as for the habits of mind and methods of investigation, which they can now apply with freedom and intelligence to "fresh fields and pastures new." Our advantages at the Fielden School are great because so many resources of learning and scholarship are accessible to us; but these are merely a hindrance unless they are reduced to a common denominator which governs all our policy, *viz.*, the possibilities and limitations of our scholars' powers.

9. *Home Lessons and the Diary.*—We have discussed elsewhere (see p. 43) some points involved in planning a time-table. As regard Home Lessons¹ this school has to pay special heed because of the unusual number of teachers and student-teachers who share responsibility in conducting the classes. We have, therefore, devised a Diary, of which a sample page is printed here. Its first purpose is to enable the necessary particulars to be entered neatly. Further, it enables everyone concerned, including the parents, to acquaint themselves with what is being undertaken by the scholars at home.

¹ For a fuller treatment of home lessons see *P.C.T.*, pp. 403-9.

HOME LESSONS. *Week commencing.....191*

SUBJECT	WORK SET	Initials when required
	MONDAY	
	TUESDAY	
	WEDNESDAY	

For each lesson a scholar enters in the note column either P for Passed, A for Absent, or N for Neglect.

When the neglect is repaired, the Teacher who set the lesson places his initials in the next column.

Until the initial is obtained the scholar must report himself each morning to the Senior Master at 8-45 punctually.

Home Lessons may be made an oppressive burden, but, rightly used, they provide a proper means for progressive activity and independent work such as cannot be so effectively pursued during school hours. They are not seriously undertaken until about the age of ten, and the amount of time they require increases slowly up the classes. In Class III. we often find scholars offering to do reading or sums at home, but no regular system is arranged until Class IV. Now, when such a system is planned, it is a matter of duty for teachers to see to it that lessons are "done," and the machinery of the Diary is employed to achieve this discipline with the least amount of trouble. We cannot pause here to discuss theories of incentives by reward and punishment, but it will readily be seen that a simple plan of control such as this, which only imposes a penalty of an extra 15 minutes' attendance before school hours, is better than any elaborate device of marks (good or bad) or of detentions. Such systems, of which there are many in vogue, are all open to the same criticism:—they focus the attention of those concerned on minor matters of the law, whereas sound government, while not neglecting good order, keeps punishment and discipline as much as feasible in the background. The Diary is just the simplest business instrument that we can devise to get an efficient output. The first axiom for the happy control of the young is to assume that, normally, they are ready to obey orders.

The Diary is already doing its work capitally; tardiness is being cured in the few obstinate cases which have been met with. Occasionally a case occurs where severe discipline, such as detention on a half-holiday, is required; well, the authority is there to be used for such emergencies. The entries in the Diary afford evidence to all concerned when strong measures are really demanded; its automatic working is its best recommendation. Machinery, if not too elaborate, saves effort. Matters that demand regularity and precision are best ruled by routine. The mind (and this applies equally to scholars and teachers) is set free for the realities of school-life if a simple machinery disposes quickly of red tape. The Diary is planned for a term of 12 weeks; it is taken to and fro by the scholar

with his school book. Every fortnight it is inspected by the class teacher on the one hand and the parent on the other; the latter is requested to affix his signature as evidence of inspection.

10. *Printed Forms: Health Records.*—In the same way we make free use of printed forms for all purposes where uniform procedure is needful. Since they are often interesting to teachers conducting schools elsewhere we keep a collection of them with a sample of the Diary. (The packet can be had from the School Clerk on sending 1/- to defray costs.)

The health of the scholars has been regularly examined, on a plan associated with the University Course on School Hygiene, since the school opened, and we may here acknowledge the indispensable help afforded by Dr. Lapage in these matters as Hon. Medical Officer of the school. Forms of Health Certificate are not only employed, but are rigorously enforced. By the kindness of two dental practitioners our scholars are also enabled to have a careful dental examination.

These records form the initial stage in a file of personal records of children's progress (*vide D.S.R.*, No. 1, pp. 12-14). Since we commenced these records in 1905 evidence has accumulated as to the scientific importance which may attach to the study of individual records of school children when mental and physical characteristics are treated together.¹ The space at our disposal in this volume does not permit of a further account of this important problem, but foundations are being laid for investigations which will, it is hoped, be ready for publication at a later date.

Leaving Certificate.—Among other printed forms the Leaving Certificate holds an important place, for the exit of the scholar from the school society is an event of capital importance to him, and the manner of this exit is worthy of attention. It is probable that, as the public come to realise more fully the value of Corporate Life in the school society, the Leaving Certificate will be more and more appreciated in all types of school, and will be looked for, both by employers and by the State, as evidence that the young people have profited by the opportunities which every good school affords.

¹See especially the final chapter in Prof. Adams' *Evolution of Educational Theory* (1912).

Terminal Reports.—A Terminal Report is also prepared at the close of each term, and a copy sent to the home, for all scholars above Class I. No doubt both Leaving Certificate and Report, if treated as means for excessive stimulus, may be abused by teachers who are too anxious and zealous. The result of German schooling serves here as a warning as well as an example; but, kept within limits, they are an undoubted benefit, and repay the clerical labour which is involved.

In many other matters of management we seek to profit by the experience of other good schools. We have no prefect system or "house" system, for we are not a secondary school, and even our elder scholars are not of an age to exercise formal authority; yet full scope is given in the organisation of games, as well as in the spirit of the school-teaching, to give play to the development of social habits. (*Vide* Chapters IV.—VII.) Those who visit the school for only a few hours can scarcely realise the extent to which our scholars, with the friendly co-operation of teachers, are learning to govern each other and themselves. One small point in class management—which is not so small as it seems—is worth noting. We keep at hand in every room a plan of the scholars at their desk-seats, and every teacher and student who takes charge of a class is expected from his first day to keep it within view, so as to learn the name of each scholar without delay. It is of capital importance, if one is to conduct a class discussion with effect, to know the names of those whom one addresses, and yet it is only too common for children and student-teachers to be strangers to each other. In the same way the Charts for Handwriting (see Chapter VIII.) are kept in every room, so that the standard aimed at by the school can be observed by all who take lessons. There is, by-the-by, little need for the teacher to write on the blackboard, since a scholar can always do such writing, and thus set the teacher free to attend to other matters. Points such as this are worth noting and observing in any school; they are only important in a Demonstration School because of the variety of teachers who take charge of a class for short periods. By attention to them we seek to emphasise the value of class unity and of personal relations between teacher and taught; these are elements in the

for school pursuits; but, from many points of view, it has stood its ground. Thus it supplies a series of simple situations which answer to the highly imaginative and fanciful state of mind of seven and eight year olds; it meets with some success the point of view from which it was advocated in those pages, viz., as an introduction to History, to which may be added Geography and Science. For all these "subjects" gradually emerge in the field of consciousness as separate studies if for a few years they are allowed to grow together in a humanistic setting such as "primitive man" seems to supply.

—And yet we who have watched this scheme of curriculum are not satisfied that the Culture Epoch Theory answers wholly to our scholars' needs, and in this paper we shall make the endeavour to expose a third general principle which seems to be significant of much that we see going on in our children's lives on the one hand, and, on the other hand, in the half-conscious demands that public opinion seems just now to be making, with even more insistence than formerly, upon the school.

2. In spite of all the encomiums passed upon popular education, and the expenditure devoted to it, the community is perpetually expressing its dissatisfaction with the teachers' "results." The business man, merchant, engineer, foreman, still more the entire domestic adult community, repeatedly affirm that the school product is not fit for life's duties; children, they say, either cannot "work," or won't work. This claim, that children shall somehow be made ready for "work," is always at the back of people's minds; time and again it becomes a leading factor in plans for schooling—as may be seen from the Report above referred to—in "the earliest days" (*i.e.*, 1840) and at the present day in the proposals for Vocational Education in U.S. America and for Trade Schools in England.

Any investigation, however, that we may make in this volume must give equal weight to the child's point of view. We readily grant all the demands made by the community that the coming race, *when grown up*, ought to be as industrious and adaptable to work as we and our fathers have been; but our

contribution to the problem must be guided by our study of *the child's attitude* towards work, and towards the "work," so called, which we offer to him during the hours of attendance at school. We have to reconcile the conflict which exists between the child's disposition and the demands of the adult.

First of all, let us make clear that the crude, off-hand mode of satisfying the needs of the counting-house and the workshop are bound to fail to-day, as they have always failed. Thus the office requires a clerk who can add up quickly and manipulate successfully the "books" wherein commercial items are recorded; and it is straightway assumed that the schoolmaster, by giving lessons, necessarily artificial and unpractical, called Commercial Arithmetic, can produce a clerk with these special powers. Now the modicum of truth underlying this assumption conceals a great amount of error. The error comes from a belief in the transference of power. The power gained by a schoolboy in getting correct answers to the sums of a text-book, under the conditions environing him with his fellows in a classroom, is so little connected with the isolated business task required in the office, that power in one direction can very slightly (even in the most commercially-minded academy) be transferred to the other. And the reason is that *immediate motive* has so great an effect upon output, and the younger the scholar the less can power be remotely transferred from one region, where product is desired, to another. In other words, if you want a lad to copy invoices correctly and to add bills of parcels, he should be put in an office to do these things, with a direct sense of responsibility for getting the work done; this being the immediate motive which the office alone understands. While at school the lad may do numberless commercial sums and vaguely know that hereafter he will be employed in somebody's office with figures; but this very occupation may, if mechanically pursued, lead to a distaste for figures, and to a misapprehension of essentials. The only value that such exercises have, in most cases, is a discipline in obedience and endurance which would serve him equally well in any walk of life and can be equally well acquired while engaged in other pursuits; in other words, he may, out of this school work with sums, secure

a *general sense* of "work," of duty, but he will get little or nothing of the special power which the community anticipates when it asks the teacher to impart commercial arithmetic.

As a matter of fact we adults, when we get to work to learn a new art, do not hunt around for some artificial exercise that will prepare us for it. Thousands of men start playing golf every year; none of them undertake preparatory exercises in which eye or hand is exercised with the intention later on of transferring the power so obtained to the green. However skillfully a golf instructor can isolate the different elements of that complex game and teach them in succession, he will always exercise his pupil in "the real thing," with the immediate motive of bringing an actual club to the actual spot where contact is desired. And while an adult who takes long views can often be coached a little with artificial exercises in a shop where golf-clubs are sold, a boy or girl will always learn quicker and better by being allowed direct contact with the real game. A boy will scarcely learn to skate on ice by practising roller-skating first; if you put him on the rink he will become a capital roller-skater very rapidly. When he comes later to the ice, he will have to unlearn some of the muscular adjustments which he acquired on the rink; the general habit of balance, which is needed in both arts, may be partially transferred, but this is of slight moment. Now something similar is the case as regards the habits required for success in the classroom compared with successful achievement in an office or a workshop.

In making these comparisons we are not in the slightest degree contemning the claim of the merchant and of the community that the school should prepare boys and girls to be capable workers; we only point out that the problem is not so simple as it looks and cannot be solved by *merely* imposing technical "subjects" which have some superficial relation with the activities of the real world of commerce and industry.

This criticism of much that goes under the name of technical or preparatory "training" may appear disturbing to some who like to devise elaborate schemes of instruction; but it may be readily shewn that it is merely a sequel to the progress that has been made, ever since Herbart's day, in general educational

theory. "The dogma of formal training"—"the fetish of faculty psychology"—has become a favourite Aunt Sally at which every lecturer on education has his fling, although it still persists as a popular superstition. Yet the dogma of "preparatory" training, so far as children are concerned up to 14 or 16 years of age, stands substantially on the same footing; and the same psychology which exploded the one fallacy must be applied to the other. The old-time "disciplinarian" declared that he could train memory by learning tables or poetry, or reason by means of Latin Grammar. This belief is shattered, but his successor still wants to defend scholastic tradition by a theory of "training"; so, instead of claiming to train non-existent faculties, he asserts that he can train *for* various specific careers in life; that he can train a lad to do one thing by setting him, long beforehand, to do something more or less like it. It is, of course, a rash proceeding to attack well-entrenched doctrines without being fully armed for the conflict; no pretence is here made that we have investigated this grave problem by exact statistical methods, but the position here taken represents the conviction of many experienced teachers and investigators of child nature. As regards students, *i.e.*, men and women in the later years of adolescence, it is clear that a consecutive course of study, such as the medical student follows when he pursues the Biological Sciences as preparatory to Physiology and Anatomy, and these again as preparatory to Medical Science proper, such a sequence is appreciated by the students and achieves its purpose. But for youngsters under 14 years of age nothing parallel to this can be usefully planned in successive years as a formal scheme of preparatory exercise. In other words, the older scholar, become a "student," can realise a distant aim for his activities and "can devote himself with a maximum of attention to preparatory studies; the "work," the final achievement, can be postponed because the mind has grown adequate to grasping the serious complexity of modern professions and trades. But the younger scholar, the child not yet grown to this power, wastes his time if he is stimulated to engage on one pursuit with the intention thereby of preparing for another.

It will, however, be at once asked why should a child at any age expect to have his fleeting desires and aims attended to at all? It should be enough for him to know, as he does know in general terms, that life is in front of him, and that his elders understand what they are about when they choose his curriculum, as much as when they choose his diet and his clothing. In a sense, of course, this is true; children must, more or less, accept our instructions and take them on trust. But it is one of the most interesting, and startling, features in the modern study of children's ways to witness the accumulation of evidence as to the importance for *motivation* at all periods of immature life. This doctrine first laid hold of pedagogic theory (so far as our inquiries extend) among the Herbartians, who among the "steps" of method laid stress on a "Preparation" (*Vorbereitung*) for knowledge which involves the realisation by the learner of an "aim" (*Ziel des Unterrichts*). The decisive advance, however, was made by Mrs. E. F. Young and Professor Dewey, and the student is referred to the monograph in which their observations were first published.¹ They hold that the child at all stages shares with the adult in the need for realising the relation between effort and purpose, between means and end, between machinery and product. The difference between them as regards ends lies solely in the power of holding the purpose in view for a greater length of time. With the youngster the motive must be immediate if the work is to be of maximum benefit, if the experience is to achieve itself in adequate product; only as development progresses can more distant aims influence conduct. This interpretation seems to the present writer to throw a flood of light on the central difficulty of Manual Training or, as we have here phrased it, the child's attitude towards work.

3. What, then, is the child's attitude towards work? To get at the truth, we must dismiss schools and teachers from our mind and observe his procedure in situations where he is free from such conventional machinery. During the present session, e.g., we have experimented at the Fielden Schools on the lines of a suggestion made in Scott's *Social Education*.² The

¹ Dewey's *School and Child*, pp. 40, 79, etc.

² A work of exceptional pedagogic worth.

scholar¹, at various ages, were given leave to choose some occupation during two periods of the school week; they were not to go home, or to disturb their neighbours, but they were allowed to choose their own pursuits, and the teacher just remained to help them if they asked for help, either by advice or by placing material at their disposal. Now one group (aged eight) on every occasion chose to clean their classroom, to wash the floor,¹ the desks and the blackboard; they made a good job of it, and persisted in it week after week without any solicitation from their elders. No one who watched them could deny that this was a normal, congenial employment, similar to that on which all children of the humbler classes are still engaged by their parents. Such domestic "work" tends, by a mischievous scholastic tradition, to be regarded as something alien to the real needs of the child. School is supposed to offer something superior, morally and intellectually, to the experience gained in work: something in fact which will rescue the child from the overpressure to which those who abuse children subject them when they force children into the labour market.

Again, we have watched our scholars when engaged upon many manual activities, pursued with an immediate purpose of achievement, *e.g.*, stitching and paper work to make exercise- and drawing-books, netting to make cricket nets, gardening to grow vegetables for sale, sewing to make garments, stencilling to decorate the classroom. In all such cases the evidence accumulates that the effectiveness of the product depends largely upon a realised motive, and not upon motives invented by the adult teacher for scholastic purposes. Further, we are satisfied that the technique necessary to produce a satisfactory result is rapidly attained when such a motive operates as the driving force. (See Chapter VII., Section 4.)

I am permitted to refer to another illustration from a neighbouring school. Among all forms of Manual Training advocated in recent years none has met with more favour than those introduced for girls under the name of Domestic

¹The trouble at Dotheboys Hall was not that Mr. Squeers set the boys to clean the "winders" but that they knew him to be doing them along with the windows. Perhaps Dickens did not understand the boy's mind as clearly as we ought to do in these days.

Economy, and none have proved so unsatisfactory because of the artificial conditions under which the "subject" has to be taught. It is well known that a variety of efforts have been made to make these conditions more "natural," *i.e.*, to provide some motive which would really act as a motive to the scholars. In some cases a cottage has been rented near a school and the girls are engaged in keeping house, under the normal conditions prevailing in an artizan's home, but without the artizan present and with a perpetual play at domestic activities which are not required. It is found difficult to persuade girls that the cleaning, cooking, etc., of such a house is really wanted; as a matter of fact it is not wanted, and the institution is little more than make-believe. Where, as in some cases, the teachers themselves reside in the house no doubt a further step is taken towards reality. Recently in Scotland a magnificent school building has been erected, in which a suite of rooms are equipped as a pretence workman's flat, all ready with beds and furniture, to be perpetually attended to for a non-existent family, as part of the domestic economy exercises. It is difficult to believe that this costly plant is worth while, for girls surely desire to be doing real work instead of pretence work. Of course, if they cannot get the real thing, they will do their best at the make-believe; but the teacher's aim should be to shew his ingenuity in discovering real situations where work is worth while. It is, therefore, with rare delight that we found our Manchester High School for Girls has offered to its Domestic Economy class a real task. The school has rented a country cottage, where the girls, on the payment of the bare cost of expenses, etc., are permitted to live at the week-ends and keep house. It is for the time being *their* cottage; the menial duties of the place must be performed by them or left undone. Of course an active supervision is exercised by the instructor in Domestic Economy and other teachers, but the capital point of the enterprise is the immediate relation between purpose and product. We need not dwell on the many collateral benefits of such an enterprise; we refer to it here merely as a fine illustration of a revolutionary tendency in pedagogic thinking, which supports the main contention of this paper.

What, after all, is "work" as seen from the standpoint of an unspoilt child? We should not be satisfied with a definition of work which will exclude *any* form of useful, *serious*, occupation; nor admit that the child differs from us adults in his desire to be, for a reasonable portion of his time, seriously treated and seriously occupied. Many adults, of course, are overworked and grow weary of "shop," which should provide the main pleasure and interest of their lives; hence we find an abnormal importance attached to holidays and recreation. This unhappy, anti-social contempt for life's labour is then transferred by adult society to the young, and induces in them also a spurious sentiment of desire for "play," in contrast to that instinct for serious application which is far more characteristic in their nature. The traditional antagonism of children to school was not due to their desire for idleness, but to the futility and pointlessness of many of the occupations offered to them, and the cure is not to be found merely by substituting manual exercises for intellectual exercises, but by informing both with a sensible purpose, appreciated by the worker.

The "old" education displayed harsh mistrust of the child, repressing him to excess, admonishing him to prepare for the stress that awaits him when he reaches our years of discretion; the "new" education (as we are freshly reminded by the bicentenary of Rousseau) ran to the opposite extreme, worshipping him as an idol and arresting his development by treating him as fit only for play. The genetic psychologist, by a more careful study of the facts, is helping us to a better diagnosis and thence to a more reasonable treatment of the child's requirements.

4. The critic of these pages will, however, still be puzzled. We are insisting that child and adult are alike: both, if happily developing in a normal life, are seriously intent upon achievement, differing only in the power of holding motive and purpose for a length of time in the mind. But is this the only difference? Are we to assume that children are being well educated if they are regarded as acolytes or apprentices satisfied simply to help their elders and learn from them to engage in the arts of life? This would be carrying the theory of

"immediate motive" to an extreme which the facts of child life would not justify. We have, in this chapter, only brought into relief *one* feature of human nature, and a full consideration of the functions of the school must take a wider view. Life, whether child life or adult life, is not all work. Jack, whether boy or man, will be a dull fellow if either "all work" or "all play" absorbs his attention.

Our harder task is the genetic one—to trace the stages by which the serious but fleeting butterfly occupations of the infant are transmuted into the equally serious but continuous achievement of the adult, and conversely to determine the phases through which the imitative, fanciful play-time of the infant is transmuted into the equally varied and rich experiences enjoyed by the adult in his recreation.¹ All the chapters of this volume deal with one phase or another of these stages. As regards work, it is clear that there are very striking changes—metamorphoses we may perhaps call them. The difficulty in describing them arises from our inclination to interpret the child in terms appropriate to our adult way of life. We contrast *work* and *play* as if play were something trivial and ephemeral. But to the infant play *is* work; it is his attitude towards experience; "it is freedom from economic pressure—from the fixed responsibilities attaching to the definite callings of the adult" (Dewey: *School and Child*, p. 48). The child of four to six first realises his interest in these callings by playing them, by acting them; our very vocabulary insists that play and acting are reciprocal terms. The child imitates his elders, simply because he has no other experience to follow; he finds himself equipped with powers, and all he can do is to copy what others do. Thus he plays, images, constructs in fancy the

¹A glossary is here needed. We define "recreation" (re-creation) as the correct opposite of work; work concludes with healthy fatigue and the subject then re-creates himself in various ways—by mere idle amusement, by sleep, by talk, or by play. The essence of play is to act a part, to imitate; in infancy work and play are indistinguishable; at a later stage of development the child differentiates and gradually reaches proper drama—there is a continuous track from the doll's house of the nursery to Ibsen's *Doll's House*. Games are contests; i.e., one particular type of play due to instincts of the race, which have or should have no counterpart in modern "work," but have a large survival value as recreation; games are thus indispensable for children and by no means to be despised for adults.

world in which he finds himself a partner; no doubt he deludes himself, but it is a serious delusion; and it is *our* error to treat him lightly and to regard his acting as mere stage-play; to him it is work.

- Gradually image and reality begin to differentiate, and by eight years of age we have the practical little person emerging. (Our girls and boys earnestly choosing to sweep the floor and clean the blackboard are examples.) Elsewhere in this volume we refer to Stanley Hall's description of this period (8—12) as "the age of stability." Every parent who recollects the reaction of his children at this period will agree as to the serious happiness with which they respond to any overtures which identify them with the daily business of the home.¹

5. This essay is but a fragment written to indicate a line of inquiry, an endeavour to interpret many scattered experiences. We may best conclude it by reverting to three topics which have been noticed above—(a) The curriculum as concerned with "primitive man," (b) The relation between the formal, technical "subjects" of a curriculum and the child's insistence upon immediate motive, (c) The trend towards technical (trade or vocation) interests.

(a) Both the Herbartians and the American teachers who follow Dewey's example have illuminated the life of little children by tracing the analogy with earlier epochs of human experience; essentially they are in line with Arnold of Rugby, who described his Rugby boys as "barbarians;" the difference being that while the Herbartians desire to let their young folk live through the culture epochs at their own pace, Arnold regarded the barbaric stage as something to escape from with all speed. Now the observer (as he witnesses children taught, whether in American schools on a "primitive man" curriculum, or in the *Uebungs Schule* at Jena on the Herbartian scheme) finds an ever-recurring discord between inheritance and environment, between past and present. The Tree-dweller, Cave-dweller, Flint manufacturer do in a sense parallel the life of the modern child; so do the Nomad, Hunter, Shepherd, Farmer;

¹ Before the age of eight many children seem to be ready to engage in domestic activities, as may be seen by a visit to the Pestalozzi-Froebel House in Berlin or the Sesame House School in London.

but it is far easier for us than for the child to image the conditions of such an existence. Certainly the simplicity of those modes of life corresponds to his child-bound limitations, but the problems which the teacher proposes to him when representing Ab the cave-dweller or Robinson Crusoe are remote from the purposes or motives which he finds in his modern environment. He does not "want" his life to be explained to him in terms either of hunting, fighting man or of tree-dwelling, industrial man. No explanation is required; it is we that introduce these explanations. They may, and do, enrich his experience and help him towards a gradually unfolding drama of human story, but when made the central theme of a curriculum, a prominent objective, they appear to puzzle rather than benefit him. Hence it appears necessary to try and *get behind* the Culture Epoch Theory, if we may so express ourselves, to find some description of the child's enlarging experience which shall recognise the survivals in him of the attitudes of primitive man, but express these in terms adapted to the actual environment of persons and things, of physical and mental needs which directly engross his attention.

In searching for such a clue it appears that we can recognise an expanding series of fields of interest, if one may so term them. At first the infant, in cradle, nursery, kitchen, living-room, is *at home*—in the house where he finds food and shelter. Life's interests and motives, as matters of serious occupation, centre round the dwelling, and have always done so from the days of the Tree-dweller onwards. Presently the child looks further afield, and in the open air, the *garden*, with its companion areas of woodland and farm, he finds both an explanation of much that goes on in the house, and scope for impulses and instincts which cannot be satisfied indoors. Animals, and also plants, live things of all kinds attract him, for he is of their kin.

Presently he finds that mind and muscle are ready to master environment more decisively; the utensils and tools, which have already been put into his little hands for his play-work activities in home and garden, now claim separate attention; both boy and girl will study contrivances and manipulate

material. The *workroom* thus emerges as a separate institution or field of action; he is not yet ripe for attention to formal technique, but tools and material intuitively claim his regard. The materials can be found from every department of simple primitive activity, not only in wood and brick and metal, but in thread and clay and paste; and subjectively the little workman begins to take pride both in the product of his handwork and his mastery of tool and material.

Meanwhile the grandest tool in the human armoury—speech—has been acquired; its symbols in reading and writing are found by the child to environ his expanding life, and presently the *book* and the library take distinct shape as a field which is worth mastering. Everything connected with books and writing, not only the art of reading, silently or aloud, but the craftsmanship required in stitching the leaves of a book, the taste shewn in decorating the cover and in forming the letters, the power obtained by writing a letter and by discovering information from print—all of this constitutes a unique epoch in the scholar's development.¹

Some such series appears to represent more nearly the stages of experience than any scheme based directly upon a succession of culture epochs. Further, while the chapters of this series succeed each other in experience, one chapter is not closed when the next opens. The interest in the house, commenced under the home roof, and, let us hope, in the kindergarten, abides right through, and is enriched by the subsequent interpretations afforded by work in garden, workroom and library. For example, the first efforts of a child in his garden are trivial: he cannot master the situation (as our experiments in the Fielden School with children under ten seem to show) because he cannot wield the tools and cannot think out relations of cause and effect. Although trivial as product they are, however, important enough to him because they help him to learn the world of "out-of-doors"; but when he gets to the age of twelve he can then become a useful gardener. Intellect and muscle are both

¹ See Chapter vii., where the complementary series of handicraft activities are worked out, covering simultaneous four groups of universal human "needs"—food, shelter, clothing, means of communication.

adjusted to the task; he can manage the tools, contrive the relation of means to an end, measure the quantities, purchase the seed, and record the results; as craftsman and man of letters both he enters upon this practical career of gardener with some of the seriousness of an adult workman. (See p. 37.)

In such a series, then, is there no place for primitive man? Certainly there is a place—analogous to the place that History occupies throughout our lives, as a *supplementary* interpretation, as an enrichment, by story and drama, of the moving scene in which he fulfils his real life. He can recreate himself, as we do, by culture; the little pragmatist who delights to sweep a floor or knit stockings or plant potatoes delights also to "play" in a wigwam, to hold court with Beowulf or sail the seas with Ulysses. As an infant his work-play activity was undifferentiated, "an endless imitation"; now the ways part; he has become a serious worker, but finds a *separate* place in his life for play, *i.e.*, for æsthetic activities in which he lays the foundation for all the fine art of adult life, as heir of all the ages.

(b) Relation to the "usual school subjects." We have thus endeavoured to find, partly on the analogy of the Herbartian or American examples, a succession of large fields of activity in which children, growing in the likeness of men, seek employment. From such a standpoint the traditional scholastic "subjects," the three R's, Geography, History, Nature Study, Drawing, Poetry, need only be pursued as separate studies *so far as they prove themselves to be required by the scholar*. It is, of course, at this point that the distrust of many cautious teachers, as well as of inspectors, of parents and all sorts of "authorities," will find expression.⁶ Faith removes mountains, but great faith is required before a teacher can accept the thorough consequences of his theory, as, *e.g.*, Professor Meriam does in his experimental school in Columbia, Missouri. It is for this reason that we have discussed above the dogma of preparatory training; for, unless we can be content to wait for results, unless we can be satisfied with crude technique, with broad and inaccurate performance by young children, we shall always be taking thought for the morrow and seek for the

unripe, precocious harvest which comes from engaging young children on highly organised, differentiated "work," such as is represented in official curricula. The child from nine years onwards has no objection to mechanical drill and drudgery, as such; but, as reiterated above, that kind of exercise is of little worth to his development except so far as he recognises a motive for it. And the motive can be found, in the child as it has been found in racial evolution, from the immediate problems that are presented by practical situations of a social type in home, garden, workroom and library.

When motive is once realised then the necessary care demanded in the details of arithmetic, writing and the like present far less difficulty. Children do not as a rule dislike "doing sums": many are even too prone to be satisfied with mechanical exercises. By placing these acquired interests on a basis of realised motive, we seek not merely to afford satisfaction at the moment, but to prevent the arrest of development.

Further, we find evidence accumulating on every hand that the scholastic acquirements in "Standard" subjects can be quite rapidly attained in the closing year or two of the Elementary School, with little regard to previous preparatory training; that the way, for example, to secure good Arithmetic at 14 is not to spend years of drill in make-believe sums from five years onwards, but to spend those earlier years on practical problems which require quantitative treatment, concentrating the mind on commercial arithmetic only at the time when this special form of mathematics is demanded, viz., at the close of the school period.

(c) *Vocational Demands.* • It is with this faith that we revert to the problem of technical or vocational education. The specific adaptations required of youth or man in his vocation are all of them the outcome of the larger adjustments and experience which grow out of life in the home, the garden, the workshop, the library. Vocation thus regarded is but a sequel, more serious in its responsibilities, to activities and interests which have kept him at "work" since he ceased to be an infant. There is not a trade or profession, however specialised, that does not stand in direct relation to these large, human affairs

that have engaged the child as a "worker" on a scheme such as we have outlined during the years of school.

In the pressure of our modern competition we have been rightly enough anxious to make the school an instrument by which our children can forge ahead, or at least hold their own among their fellows; but we have only partially understood the means by which cause and effect can be related. At first teachers believed that formal, mental exercises in time-honoured school studies could achieve this end, but a better understanding of psychology has undermined that hope. Now (as we have noted above) teachers rely upon preparatory studies allied (in our adult reckoning of things) to the vocation which the scholar is soon to take up; but here again the relation of cause and effect appear inadequate. We are driven back upon a simpler view of things; we must admit that children can only learn to discharge new functions by discharging them; that if a vocation is to be learned at school it must be practised in the school; *i.e.*, the school must take on itself the shape of an office or a workshop. This position is reinforced by what we witness in many successful schools at the present day. Thus the Industrial and Truant School, with part of the day devoted to shoemaking or the like; the Trade School, such as that established by Mr. Stanley in Lambeth, where definite jobs are undertaken in joinery and metal work, are illustrations of what we mean. The motive (call it utilitarian if you please) is immediate and prominent; the scholar is virtually an apprentice and learns the vocation under the immediate demand for product.

teacher
ar
Now it is surely possible for any school, elementary or secondary, to provide scholars, *in the few months before they leave school*, with occupations based on a similar principle. Teachers have not given enough attention to the possibilities offered by the months preceding departure from school to help scholars to prepare for a vocation. These months are very often, to the scholar himself, of capital importance; he is looking ahead, wondering where he is to make a start in life, ready to direct his interest into quarters which seem to have purpose in relation to that life. True enough in some instances

parents do not settle upon a vocation for their children until school is actually finished with, but in many instances the contrary is the case, and many head-teachers in all types of school will agree that parents are often glad to consult with teachers and accept suggestions.

Let us assume, then, willingness to co-operate among all the three parties concerned, parent, teachers and scholar as he reaches the last year of his school life. What resources has the school which is allied to the special tasks of a vocation? Conditions, no doubt, vary in every school and every locality, but one illustration may be given which has some experience to support it. Boys or girls intended for office work will hereafter have to look after stock, to "keep books," to file letters, address envelopes, take down correspondence. Now every school has, or should have, an office; many schools have games clubs, which involve keeping accounts; every school has a stock of books and stationery, which involve an inventory; every head-teacher has correspondence, registers, etc. Why should not the co-operation of elder scholars be invited for such duties? No doubt an adult, used to the job, can always do work more rapidly than a beginner; but apprenticeship implies patience with bungled and imperfect work; because the teacher keeps the office and scholars have to learn office duties is not a reason for refusing them this experience, but the very contrary. The value to the scholar lies, once more, in the reality of the experience. He is set to help in work which has to be done; and although the miniature scale on which office duties are required in a school office is small indeed compared to the large and specialised transactions of a commercial house, they are of the same kind, and if anything can be regarded as preparatory training this can.

We have made some small experiments in this direction at the Fielden School, and hope to go further; the more the activities of school simulate the life of the world outside, in domestic and in open-air pursuits, in workshop and literary pursuits, the larger will be the variety of directions in which a scholar, before leaving school, can be aided to bridge the gulf which so often confronts him when he ceases to sit in the classroom.

6. In conclusion, we must not omit to notice one motive for work which has been admitted in the history of civilisation ever since the question was raised, "Doth Job serve God for naught?" What is the child's attitude towards wages? We adults work from mixed motives; even teachers do not always teach for love! This problem invites investigation from many points of view. If, for example, it is admitted that children both can and will perform useful service below the standard rate of wage, those who claim a "right to work" (i.e., pay) will object to their under-cutting the market—"taking bread out of the mouths" of adult workmen. On the other hand, those who want cheap labour would rejoice if the schoolmaster could be induced to range on the side of the advocates of half-time for children. Already in America, where Trade Schools¹ are undertaking important handicraft work, the teacher has been required frankly to meet the criticism of Trades Unions; and the present writer has encountered a similar experience in England. If it is proved that the child is able to undertake more elaborate efforts than those involved in minding the baby or in running an errand, the situation will rightly demand attention from the economic standpoint. So far there is no evidence that his work will seriously compete with the output of adult industry, even if all schools were to offer work to children of a type such as is afforded by a few "reform" schools.

But whatever proves to be the economic value of child labour, one question remains—How does the child himself look at it? Does he expect reward, in money or in kind? We have represented him as "demanding" congenial, serious work, finding satisfaction in product. But he "is individualistic; he early develops an instinct for property; his environment also quickly teaches him the law of exchange, and, in due course, the nature of money as a symbol of property and power. Granted that he finds satisfaction in labour, he cannot be expected to translate this feeling into a more remote satisfaction (such as the teacher feels) in the prospect of his own development. Attempts have been made to trace the growth of the sense of property,² but we have

¹ See Dean: *The Worker and The State*.

² See Stanley Hall: *Aspects of Child Life* and Earl Barnes: *Studies in Education*, vol. i.

no space to discuss these in this paper. In the Fielden School the issue has been recently raised in connection with the garden. The boys in Class VIII. cultivate vegetables, and, after paying for the seed, they have been allowed to sell for their own profit, each scholar disposing of the portion produced by his own allotment. An amusing display of commercial activity has been witnessed: thus, a harvest of potatoes is sold long before it has matured; speculation on the worth of a crop seems to delight some boys, others shew quite plainly a readiness to dispose of a worthless crop (especially broad beans when the blight has caught them!) among ignorant purchasers, and thus a clever speculator sees a chance to become a trader rather than a producer.

Hitherto in this country the chief attention of teachers has been drawn (under the direction of public authorities) to the need for training boys and girls in thrift; the school savings bank is a great institution. But earning and spending are quite as important as saving (and oftentimes more difficult). A scout can easily be led to accept Baden Powell's warning against begging and find a healthy stimulus in undertaking a job which will earn money for his troop. Our short experience in this matter goes to shew that a school which gives play to practical activities can do much, in co-operation with the home, to guide the development of ideas as regards money values, helping boys and girls to reconcile the claims of *meum* and *tuum*. In this, as in every department of morals, the young are attentive to our adult conduct long before we suspect; they watch our behaviour, copy our standards and pay less heed to our exhortations than to our example. The school is not a market-place; but, as a place where young people work as well as play, it can, and should, provide a field where the value of labour can be examined and appraised. The inquiry here opened is one which, we may confidently assert, will prove of increasing importance in the educational theory of the future.

NOTE.—As regards vocational demands (pp. 33-35) it has been pointed out that in our Fielden School we labour under the same practical difficulty that besets all primary and most secondary schools, viz., that some scholars leave our higher classes (vii. and viii.) to continue their schooling elsewhere, and only a percentage remain with us to complete the course. Those who leave for that purpose are, very

often, of a more intellectual type, and it is a serious loss to the higher classes of a school to be deprived of them. This difficulty cannot, however, be surmounted. Our duty to care for those who stay, by arranging a curriculum suited to *their* vocation, remains, whether or no the numbers in these classes are diminished through extraneous causes.

REFERENCES.—By the present writer: *The Teacher as Craftsman* (*Educational Times*, Dec., 1911, and *Manual Training*, Mar., 1912) and chap. vii. of *The School* (Home University Library).

KERCHENSTEINER.—Various writings by this distinguished educator.

Dean: *The Worker and The State* and O'Shea: *Dynamic Factors in Education* supplement the reference to Dewey given in the text. For the present trend among English teachers the two magazines, *Educational Handwork* and *Manual Training*, can be consulted.

J. J. FINDLAY.

CHAPTER III.

GENERAL REVIEW OF THE SCHOOL PURSUITS.

1. In the Introduction it has been already noted that we are content with a naïve statement of the general goal before us in planning this scheme of pursuits. None of the popular formulæ—"development of faculty," "training of character," "social efficiency"—render us practical help. The last, in spite of the attractive adjective prefixed to "efficiency," seems to us to do little more than express the creed of the smart business man, who, in these days more than ever, seeks to capture the educational machine in the interests of what he calls "success." It is right enough, as we have seen in Chapter II., that the teacher should be challenged to bring his cloistered school into relation with "the world," and shew that school acquirements function in the wider realm which awaits the scholar thereafter; but the danger of distortion and of degradation in this view cannot be denied. And is there not, after all, some room for the inefficient? Is every wistful soul to be driven by the restless stimulus of competition?

" . . . for he both man and boy,
Had been an idler in the land;
Content to merely feel and see
The things that others understand."

Now, if, to use the pragmatist's phrase, up-to-date pedagogy has "no use for" Wordsworth, then we have no use for up-to-date pedagogy and its gospel of social efficiency.

We must be content here with this cursory criticism of the teleological formulæ which have played so great a part both in the theory and the practice of our profession. Admitting that they all represent partial truths, and emphasise in turn aspects of behaviour which demand attention, we have to look elsewhere for help in the constructive work of planning a curriculum.

2. There is no lack of subjects on which to engage the scholar—language, science, handicraft, story (human and divine), geography, literature and arts; they crowd upon him; all are important, all can be represented as achieving some fine ethico-social purpose. If he is fitted by natural endowments, he can ultimately acquire interest and power in any of them; but, as we have seen, our problem,¹ in teaching him, is to find out his present attitude and relationship to these branches—to see what there is in him at the age of 5, 7, 10, 12, 14, to respond to those large mature fields of experience which we label Geography, or French, or Algebra. This point of view has been so clearly expounded by Dewey in his well-known essay on "The Child and the Curriculum,"² that we need not labour it; suffice it to repeat that our main effort in working at this curriculum has been to investigate the minds of our scholars—to use not only our own acquaintance with them, but the resources of pedagogic literature to aid us in selecting occupations which shall correspond to progressive changes in impulse and in power.

Our scholars come to us, if we use the simplest popular language, to gain experience.³ They are gaining experience anyway—at home, at church, in the streets, in the parks. Experience, after all, is what they are after; the help we can give them is to enrich it, by adding what they could not secure apart from our assistance, to enhance its value by absorbing their interests in matters that are worth while, and so leading them to discard what is useless or base—above all, perhaps, to organise it (1) by bringing the different fields of experience into relation and (2) seeing to it that there is no arrest of progress; for, as the organism grows, with new powers which feed on the accumulated store, earlier experience takes new shapes; the dominoes, the bean-bag and the toy bricks of the Kindergarten become the arithmetic and geometry of the school, and eventually the motor-car of the engineer.

Here, it seems to us; are the real problems of a scientific

¹ P. 28.

² *The School and the Child*, pp. 17-47.

³ For the most recent exposition of this formula, see Williams: *Education: A Survey of Tendencies* (Glasgow, 1912).

pedagogy—in the interpretation of the phenomena of child behaviour at successive stages, and in directing the experience at each stage.

3. This control has to follow at the same time two diverse lines, which we may call the latitudinal and the longitudinal. At any given stage of life the scholar is a unity; all his pursuits and experiences entwine in the one life; he is not craftsman, geographer, arithmetician, linguist at different hours of the day, and yet for school purposes we have to confine his attention to one of these fields of experience at a time.

Mathematics, for example, grows very gradually with the years (see Chapters XIII. and XV.), and we have to forecast the stages of this growth, longitudinally—from the entirely sub-conscious appreciation of number and form in the nursery to the distinctively logical, separated conceptions and arguments of the young geometrician of 14. This growth can be conceived by us *in vacuo*, but in the organism itself it only lives by contact with the realities sought in fields of experience; hence the need for a latitudinal view of the curriculum, for what is popularly called “correlation of subjects.” It is not so much, however, a correlation of one branch of the curriculum with another, for all the branches are, to the immature mind, remote and artificial; our quest is rather for contact with reality. If science, *e.g.*, is to be a forceful activity in a child’s mind, it must function in that mind not only in “correlated” exercises labelled “practical arithmetic,” but in any field of experience the youngster finds available for interpretation in terms of number and form. We fully recognise, therefore, that by presenting a series of chapters, each dealing with one branch only of the school pursuits (the longitudinal line), we are running a serious risk, *viz.*, of making the pursuits and not the scholars themselves the real objective. This risk has always been present to the writers’ minds, and the active interchange of views among colleagues described in the Preface has been designed to minimise it; only the reader can judge how far we have achieved success. As examples shewing how the united programme is carried out in daily working we have inserted Chapters V. and VI., where detailed accounts will be found of the proceedings of two classes.

4. The school contemplates a course extending over ten years. A class is provided for each year, and thus we have five stages, somewhat as follows:—

First Stage	...	Kindergarten	...	Under 6 in September	
		Transition	...	" 7	"
Second Stage	...	Class I.	...	" 8	"
		" II.	...	" 9	"
Third Stage	...	" III.	...	" 10	"
		" IV.	...	" 11	"
Fourth Stage	...	" V.	...	" 12	"
		" VI.	...	" 13	"
Fifth Stage	...	" VII.	...	" 14	"
		" VIII.	...	" 15	"

The classes are constituted each September, and it is rare for a scholar to fail to go up with his class year by year (except in the Kindergarten, to which a child is sometimes sent under five years of age).

Beyond what is stated in this chapter, the present volume deals almost entirely with Classes III. to VIII., *i.e.*, children of nine years old and upwards. By the time children have reached this period they have grown to be practical little creatures, ready to undertake the "work" (see Chapter II.) of a school-day, with a growing consciousness of the difference between groups of pursuits. Although most of the rubrics under which school pursuits are classified will be found in our time-table, we combine related studies as much as we can, for reasons which are repeatedly advanced in various chapters. Thus under Humanities, History, and Geography are subsumed, while Natural Science takes the physical side of Geography under its wing; Physical Exercises include Drill. One important addition appears in the time-table—a weekly Bible Lesson is taken from Class I. upwards; this is treated quite separately from the rest of the curriculum. The Herbartian plan, whereby a sequence of Biblical narrative is arranged *pari passu* with the rest of the Humanities syllabus, is adventurous and interesting; but we find that the function of the Bible Lesson is best understood when it is kept apart and taken by

teachers who offer their services for it with a personal sense of the special place that the Bible holds in a Christian community. (Parents can, of course, excuse their children from the Bible Lesson on request.)

Omitting this weekly lesson, we proportion the available time somewhat as follows:—

Humanities	...	...	...	...	...	14	per cent.
Arts and Crafts	...	...	...	...	...	14	"
Literature	...	...	...	...	...	7	"
Language	...	...	...	...	...	21	"
Natural Science	...	...	...	...	...	16	"
Mathematics	...	...	...	...	...	21	"
Singing and Physical Exercises	...	...	...	...	...	7	"

100 "

The only important variation is that less time is required after Class VI. for Language work, and the balance enables more time to be given in Classes VII. and VIII. to the Humanities with the Arts and Crafts. One period at least per week is entered as "unallotted." (See p. 25.)

The periods allotted to Arts and Crafts are kept separate in the time-table, but whenever possible they are taken by the same teacher who directs the work in the Humanities, for reasons given in Chapter VII. To enable this connection to be more easily established the endeavour is made, in arranging the weekly time-table, to make some of the periods for Arts and Crafts continuous with those for Humanities, so that a teacher can, at need, spend two consecutive periods on one theme. This is one example of a principle which will be found suggested repeatedly in this volume, viz., the *intensive* application to one theme (see *P.C.T.*, p. 120) in contrast to the modern plan, which provides a too great variety of themes, and tends to distract the scholar's attention by quick changes. The time allotted to Arts and Crafts is not wholly devoted to realising ideas springing out of the Humanities. The scholars are invited to spend much of their time in preparing, or helping in the preparation of material required by the school, and in pursuits such as gardening (Class VIII.). The time allotted to Literature may

seem scanty, but it will be noticed (Chapter IX.) that under this rubric we include only the fine art of Language. Much valuable reading also finds a place in the Humanities scheme. Care is taken in Home Lessons (see p. 13) to provide time for learning poetry by heart as well as for silent reading.

As regards Language study, Handwriting keeps its place as a separate lesson only until Class IV. With the exception of a short course in Grammar and the study of words taken in Class VI. the rest of the time available is spent on French, which demands a daily lesson for the first two years of the course, as described in Chapter XI. The intensive principle is again illustrated by the treatment of Mathematics. By allotting all the Mathematics work of a class to one teacher we make it possible for him to devote all the time, if he wishes, to one theme for several weeks. Singing and Physical Exercises (taken in the open air) are grouped together because conditions of weather make it convenient to choose one or the other at need.

5. We are glad to welcome children in the Kindergarten as early in life as parents feel disposed to entrust them to us, not because we desire prematurely to "teach" them school subjects, but because they are welcome to share the social experience of their little friends and their teachers; also, in this Demonstration School, for the special reason that our studies in development are aided by having them in our community at these earlier periods of life. We retain Froebel's title, Kindergarten, for this group; it helps to free the teachers from any responsibility for making advance in organised studies.

There seems at the present juncture to exist, within the Kindergarten movement, considerable difference of opinion as to principles. On the one hand there is a well-established tradition, based more or less on Froebel's own practice, which makes much of organised leadership by the teacher in song, story and directed play. These are mainly connected either with domestic and familiar interests of the home, or with the changing aspects of the seasons, and find active expression in "occupations" which utilise not only the Froebelian "gifts," but all sorts of available material, clay, paper, beads, raffia, etc.

in some quarters doubt is raised whether any attempt should be made, at least until the sixth year, to organise any syllabus of "subjects" at all; to attempt any consecutive plan either for a term or for a week. The little ones kept at home for this period do not receive such control; every day to such an infant is a new world; yesterday is forgotten, or, rather, the new impressions of the moment are too vivid for it to be worth while to conduct the mind back to what was the concern of yesterday. Nor does it seem as if natural development is best achieved by requiring all the little ones to attend to the same topic after the manner of a "class."

Our Kindergarten teachers had already been feeling their way towards reform in this direction, rebelling almost against the rigid orthodoxy of the Froebelian cult, and now the sudden onslaught of the Montessori method has stirred everyone to a re-examination of the situation.

As regards general principles of school management Montessori is certainly helpful in encouraging the teacher to **BREAK UP THE CLASS** on all possible occasions. This is a general principle, applicable to all sorts of school pursuits, notably to laboratory work, and it is one aspect of a still more comprehensive doctrine which claims freedom and individual development for each scholar, in contrast to the submission of will and of initiative imposed by membership in a class. While the principle is not new, the teaching profession is greatly indebted to Montessori's researches for an illuminating illustration. As regards the pursuits of infants Montessori's contribution follows two directions—firstly, training in personal hygienic habits and in what we call "social activities"; secondly, exercises, elaborated with great skill, for the various senses. This first type of pursuits has not received much attention in England, but the Sesame House School in London (based on the system of the Froebel-Pestalozzi Institution in Berlin) is a notable exception. In the Fielden School the spirit of social activity and of co-operation has been fostered, not only with the little ones, but throughout the school; we are encouraged by the success of the Montessori Method to organise "social activities" more completely, even with the youngest children.

The second type of pursuits—concerned with the various senses—appears to be the field in which Montessori has done her most original work. Here again Froebel was a pioneer, and many Kindergarten teachers play “sense-games” with their children. But the unique knowledge of physiology and psychology (as regards both defectives and infants) possessed by Dr. Montessori has enabled her to devise a series of educative toys which are evidently of the highest value. We are convinced that her researches need to be continued and applied to English children. By the kindness of Mr. T. C. Horsfall, Miss Steel (Senior Mistress in the Primary Department and Kindergarten mistress) has secured examples of the most important “Montessori” apparatus, and while this volume is being prepared for the press we are conducting experiments with our youngest children. The results we secured from these appear in Appendix II.

6. Beyond the Kindergarten we have retained also the title “Transition” for the class above the Kindergarten. Historically this name was not chosen as representing a transition period in child development, but a transition from the Kindergarten type of teacher to the alien methods of standards or forms taught by other than Kindergarten teachers. Since with us there is no alienation in sympathy between those who help our children of five and those who look after the elder ones, the retention of the name at this point is not required for such a reason, but is merely retained for the sake of convenience. Undoubtedly there is a change in the child’s powers; he should not leave the Kindergarten until he has sufficient power in continuous attention to enable him to forego his own absorbing topic and co-operate in the pursuits of a class. These pursuits take definite shape as the year progresses; for reading and handwriting, see Chapter VIII; for mathematics, Chapter XIII. Such formal studies, however, do not bulk largely in the immediate field of interest. We have to give scope to more immediate activity if we are not to arrest normal development at this period. The little boy and girl is incessantly active; the brain works through muscle; the physicians keep warning us of the need for an abundance of movement. Hence we have sought for occupations which not only provide for manual training



PLATE II.
The Transition Class (aged 6) engaged in "Domestic Activity." See page 47.

as ordinarily understood, but for continuous active achievement on a familiar plane. Since the home, with its rooms and walls, is still the centre of their life, our teachers during the last three years* have allowed this class to try their hand at constructing a one-storey house, using actual bricks and mortar,¹ after first visiting a street where houses are being erected and getting "points" from the workmen. This scheme deserves a fuller report than we can find room for here. It is important to note that the teacher does not dictate plans of work; the structure is only of educative value so far as the suggestions for work (not merely the execution) comes to a considerable extent from the scholars. This building, with many other industrial activities arising therefrom (carpentering, furnishing, decorating, etc.), forms a point of departure for many other occupations during the entire year. Their house must, of course, have a garden, with interest in live things, plants and animals. Their own classroom, next to the home, is felt to be an object of delight, and their activity, if so directed, finds an outlet in caring for its order and cleanliness. It will be seen that all these activities are social as well as industrial in their nature; thus a foundation for co-operation in school pursuits is here laid, which is essential for progress in class work right up the school. Some remarks on the literature, art and music at this stage will be found in subsequent chapters.

Domestic activities are being cultivated with rare pleasure by these six-year-olds. The daily lunch is placed in their care; they wash their toys and other material, including the dusters and other cloths that are required. Order and cleanliness are not imposed upon them but have become a pleasure, and the habits here created follow them in the next stage of school and home life. Ideas and sentiments of attachment to the school are fostered by letting the scholars see that their help is really needed. Thus Class II. at the present time have undertaken to keep the front part of the school grounds tidy; in spite of all the care taken by teachers children are forgetful and tend to litter the place with waste paper, tram tickets and other unlovely

¹ Compare *The Montessori Method*, p. 166, and Pritchard and Ashford: *An English Primary School*, pp. 13, 14 and 121.

decorations: so we look to Class II. to perform duties which otherwise would fall upon caretakers, who are occupied in other good work which they do for us.

7. With Classes I. and II. we enter upon new problems, the discussion of which would take us beyond the purpose of this review. The child is now able to hold in his mind more continuous relations of cause and effect. A story which proceeds from day to day can hold his attention; he is more "practical" than in earlier years simply because he finds himself able to conceive of ends achieved by his own power.

Now it is easy to plan a curriculum which shall merely supply a class with occupation during these years in the school "subjects"; but educational reformers have disagreed much in attempting to infuse the dry bones with elements of culture.¹ During the last four years we have experimented on the lines suggested by Dewey,² giving a prominent place to primitive industries and stories connected therewith. In the preceding chapter we have discussed some of the difficulties presented by such a scheme, and the teachers now in charge of these classes are working out a curriculum in which "primitive man" will only play a minor rôle. In Class II. the legends of Greek heroes, especially the wanderings of Ulysses, are finding a prominent place.

Children at about the age of eight seem to be more in a transition stage than at six, and the difficulties which surround the curriculum are due, it would seem, to uncertainty as to how best to help the child to pass from the infancy of the Kindergarten to boyhood and girlhood. The make-believe life of five and six develops by eight years of age into a new system of experience. On the one hand the child has become "practical," keen to accomplish things (and among the rest to master the elementary arts of reading, writing, number, drawing, etc.). On the other hand, fancy develops into imagination, and the enjoyment of romance, of drama, where the characters are no longer identified with the little one's own life, becomes possible. As regards the practical side of the curriculum the difficulty is not great. Rapid progress can be made in laying a right foundation for reading, writing and arithmetic, and plenty of time is allotted to achieve this purpose.

¹ See *P.C.T.*, pp. 153-158.

² *School and Child*, pp. 71-73, and *D.S.R.*, No. 1, chap. vii.

8. With Class III. we enter upon the schemes which are outlined in Parts II., III. and IV. of this volume, and only a few notes are here required in order to bring into relief some of the salient features which these present.*

Among branches represented in the time-table not outlined in a syllabus Physical Exercise will be noted. The little ones are engaged in Musical Drill of various kinds with and without apparatus; the older scholars play the regular school games. Simple "country" dances, as taught by Mr. Cecil Sharp and others, have also been introduced. Here again there seem to be differences in pedagogic principle which can only be composed after further experiment and investigation. At the one extreme we have the system adopted by the Board of Education, based largely on the doctrines originally taught by Ling in Sweden. Quite opposed to this we have pursuits, of which the folk-dance may be taken as typical, in which the teacher pays no regard to the exercise of individual muscles, but supplies opportunity for æsthetic enjoyment and the expression of music. Within the last year or two the method of Rhythmical Gymnastics taught by Jaques-Dalcroze¹ has come into the field, and this also will speedily make a claim in relation both to the physical and æsthetic development of young children. The advocates of all these systems are enthusiastic, and it is clear that a good teacher can secure response from scholars in any of them; for by the age of nine children certainly appreciate any form of concerted physical activity carried out under orders, whether it be marching, singing, flag-waving or dancing. The point to be solved is to determine which of these is best calculated to assist development, *i.e.*, to make the body a fit instrument not merely for the sustenance of health, but as the servant of the higher life, alike emotional and intellectual.

In Part II. the reader's attention will be attracted first of all by the close relation of the Humanities to Arts and Crafts, secondly by the large conception taken of the meaning and purpose of History. It will be perceived that the syllabus is not merely the substitution of a certain amount of social or economic study for "the ordinary school history." Very much the contrary is the case. A similar aim to that here proposed

¹*The Eurhythmics of Jaques-Dalcroze*, 1912.

has no doubt been stated before, and teachers like Dewey have worked out a similar principle of development as regards little children, but it is here boldly designed right through the school years.

No doubt by many teachers the Humanities syllabus will be regarded as too ambitious because of the extensive ground which is proposed to be covered; but, after all, nothing is here attempted, so far as reading is concerned, beyond what actually happens in the experience of many youngsters whose home environment as regards books has been favourable.¹ Young people of ten to fourteen years of age, once introduced to books and pictures, are greedy to absorb new experience. This syllabus offers to our scholars the chance of culture which has hitherto been available only to the few whose parents possess a voluminous library, or to a more select few who of their own motion have striven to get at books and learn from these apart from school instruction.

It will be seen then that one essential for the success of this syllabus is an ample provision of books and pictures, conjointly for teachers' and for scholars' use. Here a distinct need for reform in all types of school should be emphasized. The last thirty years has witnessed an enormous increase in expenditure for equipment in science, art and handicraft teaching, but teachers of the humanities are too modest in their demands. Most schools are content to supply each scholar merely with a history-reader or text-book, instead of providing a class library and other material adequate to the situation. Now that such a variety of cheap books, from sixpence upwards, are published by such firms as Blackie & Sons, Dent, Nelson, Harrap, it should be possible for the History classroom of the poorest school to meet this demand.

But the apprehension of the ideas outlined in this syllabus is by no means an affair merely of books, or of discourse by the teacher. Art and Craft play an indispensable part. This apparent subjection of Drawing and Craft pursuits to the Humanities will no doubt be viewed with alarm by many specialist teachers, but our standpoint is presented without

¹For a recent example, see the *Reminiscences of Professor James Stuart*, published last year.

disguise. The training of young people to be artists or craftsmen is not the concern of primary schools; the powers necessary to such achievement emerge only during adolescence. But the foundation is here laid, a foundation not only necessary to the development of the fine arts, but to the development of other sorts of specialism, *e.g.*, in history or in literature. As regards art, while we have no desire, or claim, to exhibit the performances of our scholars as in any way remarkable, we are prepared to submit what they can produce to the examination of competent persons as evidence of the value of a curriculum which allows technique to wait upon motive.

9. The place here assigned to Handicrafts will be recognised to have close relation to the movement, of which Ruskin was the chief apostle, for the restoration of "peasant" arts and industries, in contrast to the products of modern machinery. We cannot profess sympathy with the extremists of this school who desire to engage large numbers of adults in a vain effort to put back the clock.¹ In any case, these pages are not a fit place for discussing that problem. But these would-be restorers of the past are in the right place as teachers of children, for it is only as the child, with his own hands and brain, makes and shares in the making of bread or cloth, of thread or brick, that he comes to understand industrial history. The modern industrial city, the modern machine, the modern cheque book and banknote, the modern Act of Parliament, are inevitably accepted as final and sufficient, unless the new generation learn by first-hand experience to see them as the outcome of earlier methods equally worthy and equally efficacious in the days of old. This, be it said, is an argument additional to the simpler plea for handicrafts based upon child-psychology.

It will be observed that while Handicraft and Art are thus brought into one general plan, their function is not wholly subordinated to the service of the Humanities syllabus. In the previous chapter some reference is made to the variety of ways in which our scholars share in useful activities; in particular it should be noted how valuable we find the garden, which excels all other crafts in the revelation to the young of their capacity to utilise nature in *producing* something. In two of the classes

¹See *The Vineyard*, June, 1911.

(III. and VIII.) a special syllabus is planned, each scholar, or pair of scholars, having a plot of his own, and a small garden is kept collectively for each of the younger classes, from the Kindergarten to Class II. In Class IV. a garden is allotted as an adjunct to the Nature Study. In Class VIII. Gardening occupies a large part of the time assigned to Handicraft (three periods per week), the boys being sent to the garden, while the girls take Needlework. Such a distinction between the sexes will not be universally approved, but it seems to correspond to the variant tastes of most boys and girls at fourteen years of age. We certainly find that few girls care to grow vegetables; they are far more interested in cooking them, and we should have added a cookery and laundry course if we had felt that we could undertake it with the scanty resources available in our building.

Theoretically, no doubt, it would be a good thing if all boys learned to cook and to sew, and all girls to handle the plane and the spade; but we must take social conditions, within limits, as we find them. Our scholars are influenced by the upbringing and environment of their day and generation; we should be doing them harm if, in our zeal for better ideals of sex-relationship, we compelled all our scholars to follow the same pursuits.

One quite exceptional addition to the equipment for Handicraft should be noticed, viz., the hand printing-press. (A specimen of the work produced by the first class which has undertaken this craft is attached.) The grounds on which we adopt this pursuit are explained in Chapter VII.; incidentally it may be noted that both printing-press and typewriter exercise a beneficial influence on spelling and punctuation. We are not concerned to produce either bookbinders or printers, but we have good evidence that these exercises play a useful part in a scheme of liberal education; these, together with the plan for a reformed handwriting, are designed not only for practical but for æsthetic purposes; indeed, our entire scheme of arts and crafts is intended as a testimony to our belief that the beautiful and the useful need never be disjoined in the school, however much the necessities of life appear to divide the two thereafter.

GENERAL REVIEW OF PURSUITS.

In Part III. the inclusion of Singing with Languages is justified, not on the ground of correlation, but from the fundamental nature, as well as the historical origin, of these arts. However widely apart the musician of modern days may be from the man of letters, they are conjoined in the service they render in child development. Although Dr. Keighley's chapter is mainly concerned with positive directions as regards progress in technique, he makes it abundantly clear that singing is no mere technical exercise, but is to result, here and now, in songs which the scholars feel to be worth while, as the most direct form of personal expression. Because the appeal is so direct and immediate, it is possible at an early age to interest the scholar in a technique which in other arts, such as drawing and the crafts, would be a hindrance.

In Part IV. we have again departed from the usual custom as regards nomenclature, having dropped the title Geography from the time-table. But specialists in this subject, if they examine the syllabus in Physiography, and with that the ample space afforded to geographical topics in Part II., will admit that this study receives full recognition. Geography which has successfully struggled for recognition both in Universities and schools, has been in reality hampered by its success. Our endeavour has been to give point and precision to the whole field by bringing the separate parts into relationship with the rest of school experience; only thus can our scholars appreciate how indispensable Geography has become, not only as a means of liberal culture and of social interest, but as a scientific tool alike in commerce and industry.

Science teachers will, perhaps, miss in Chapter XII. some of the topics included in text-books, but it will be seen that the selection is by no means guided by anxiety to provide complete schemes of scientific information. Such schemes are appropriate to University or higher secondary teaching, but have no value at this earlier stage. It is more important to secure that the ideas formed in the youthful mind by experiments and discourse should be related to experience. Our heating apparatus, electric fittings, trees and plants in the garden are as valuable for this purpose as the laboratory. The latter, indeed, while indispensable, becomes a hindrance if its exercises

are cut apart from the common affairs of the environment. Thus the syllabus here presented represents a close alliance of the adult conceptions of modern science with familiar, unorganised topics which are waiting ready to hand for interpretation.

10. *The Closing Years of School Life.*—We had designed to include a separate chapter on this theme, but what is said in Chapter II. as regards Vocational Education will serve to indicate the policy here pursued. This is supplemented by references to the same topic in several of the syllabuses as regards Class VIII. In this matter a syllabus can only achieve partial success in any type of school, since scholars leave at irregular periods and for such diverse purposes; some, *e.g.*, proceeding to a further place of education, others leaving before they have completed the school programme. Notwithstanding such hindrances, it seems clear that all possible emphasis should be placed on an epoch which means so much to the youth himself. Boys and girls about to leave school unquestionably think much about their future, however little their thoughts are expressed to adults. (Compare pp. 33 and 34.) In earlier years their teachers have been preparing them for "life," partly by steady attention to the formal school subjects, partly by that wide enlargement of experience which appears so prominent in the following chapters, partly, let us hope, by the unconscious influences of a wholesome school society. But this preparation is not, and should not be, brought to the focus of consciousness until the time of change draws near. Motive is then recognised for pursuits and interests which previously had little meaning. Without any elaborate discourse on the issues of practical life a scholar at this stage will often respond to what is offered him with a seriousness of purpose which in earlier years was foreign to his nature. (Compare p. 34.)

Thus from infancy to adolescence we watch over the development of these young folk, and seek to offer at each stage "food convenient for them." By sharing somewhat in their happy life we are enabled, teachers and students together, to test the validity of our principles. Both in failure and in success we demonstrate the benefits to be secured by bringing the researches of the academy into touch with the realities of practice, as we undertake to order the pursuits of the Fielden School.

J. J. FINDLAY.

PART II.

THE HUMANITIES WITH THE ARTS
AND CRAFTS.

CHAPTER IV.

THE HUMANITIES: ESSAY WITH SYLLABUS FOR FIVE CLASSES.

Glossary.—Changes in pedagogic practice are necessarily accompanied by the adoption of new technical terms. Twenty years ago teachers used the term "English Subjects" as vaguely indicating any studies that involved either reading books on the one hand, and English grammar or composition on the other hand. But with the invasion of Herbartian pedagogy, teachers found a larger purpose in these studies and a new term was required: something answering to the German *Gesinnungsunterricht*.¹ Thus "Humanities" has gradually been adopted, to include not only the old Humanism of Greece and Rome, but modern Humanism as well.

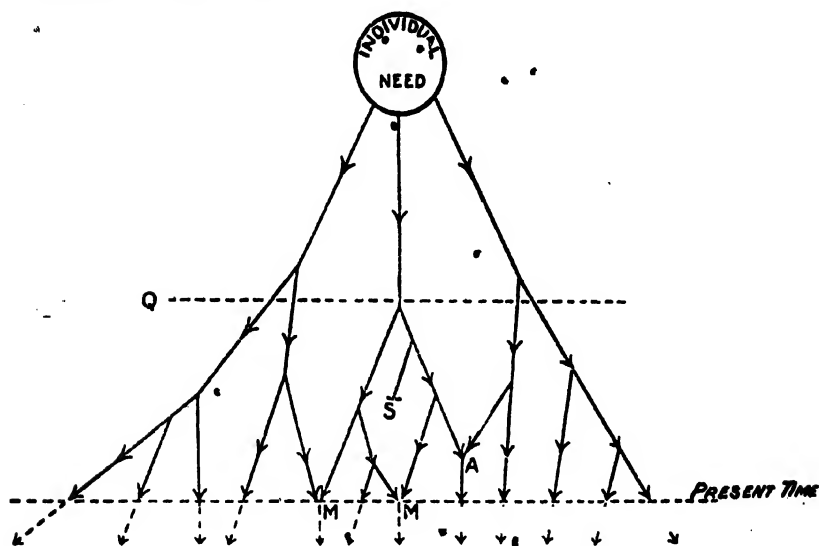
1. The following diagrams illustrate the principle of the successive development of humanistic institutions which underlies the entire scheme of study (see p. 30). Previous to the age of nine (Class III.) the scholar's interest is centred around what is called "The Home," but these experiences have been gathered merely on the empirical plane. Now the scholars are ready to bring together the scattered threads of their experience and conceive of the manifold activities of individual life and social life as a united whole. They begin to apprehend in fact the meaning of institutions. True, they are still ego-centric and continue to construct their scheme of life in a personal setting, but the house or the family is now grasped as an organism which unites many of their activities, and this organism is discerned as having permanence; the past and the future come to display themselves apart from the present, and the combination of families into more complex unities, such as tribes or nations, has some meaning, no doubt very vague, but still quite serious and sensible. We believe that this diversity and this unity is most clearly seen by children in what we now call "the division of labour"—division not only in industrial and public pursuits, but even more clearly in the concerns of domestic life. This, then, is the "history" which our scholars pursue right up to Class VIII., witnessing successive differentiations in human institutions. We have attempted to picture for the teacher's use this gradual broadening of experience in two diagrams as follows:—

¹ See *P.C.T.*, p. 67.

DIAGRAM I.

PROVISION OF FOOD, CLOTHING, SHELTER,
AND MEANS OF INTERCOURSE,
by each individual or family.

From this unified beginning, by specialisation and division of labour, and the regulating of it, gradually emerge institutions which are further differentiated or die out according as they fulfil the needs of a developing society; until the present complex organisation is reached. It is important that children should understand that human institutions have *direction* and *possibilities of development* as well as a more or less stable relation to life. Thus:—



If a child is learning of the Norman Period in a history lesson and in a geography lesson is studying the railways of England, it is obvious that the child is trying to comprehend the state of society represented by the line *Q* and at the same time trying to fit in the railways in a fixed position in the line *P*. Thus the sense of development and direction will be lost.

At times an institution may be found to be unfitted to a later development of society and cease to exist as at *S*. Institutions may be found to merge into one another as at *A*—or may seem likely to merge in the future as at *M, M*.

THE HUMANITIES: ESSAY.

More or less unified and undifferentiated individual life, gradually developing

Government and Caste

Commerce

**Agriculture
and
Industry**

Agriculture and Industry

Politics

Local Life and Government

2. The tendency in most History teaching has been to treat the past purely as something which once *was* in time, and quite apart from any appreciation of how it *became*, or of its relation to future developments.

We do not by this statement deny that in the following out of a History syllabus considerable time has often been devoted to the treatment of cause and effect, but we hold that this principle has not been carried far enough; the treatment has been too much confined to the mere succession of one event upon another. Our plea is that it is necessary to go further to find a deeper basis for any real discovery of developmental ideas. There has been little appreciation of that interaction of man's need with physical resources which has resulted in the present state of affairs—an interaction fruitful and prophetic of that which is to come, and not merely stationary and stagnant. In the same way, in spite of attempts to treat of disconnected causes and relations, Geography is largely a study of what *is*, with little idea of tracing the course of its *becoming*. The true basis of a historical or a geographical idea is neither event nor fact, neither what *was*, nor what *is*, as such, but how it *became* and what is *coming to be*.

The passing of an Act of Parliament well illustrates what is here meant. It is of very little importance in itself to know that at a particular moment a Bill is introduced into the House and after a period of consideration passes into the Statute Book; but it is of the utmost importance to understand the origin and growth of the idea in the nation's consciousness which is embodied in that Bill, to study the way in which these ideas clash with the rigidly fixed ordinances of State, and how they modify the trend of civilisation when the alteration of the law gives them freer play. Acts of Parliament are little more than ledger entries, at certain points, of the transactions effected continually by the various functions in the evolving of life; they serve as milestones to indicate where national life has got to; they are fixed and rigid things to be glanced at and passed by; life is ever moving and developing, and it is our business to afford a grasp of this movement and development.

If we were to gather all the milestones from Land's End to John o' Groats into a field and inspect them in order, they would

be of little help to one who wished to know the pleasures and difficulties of travelling that distance. The important thing about milestones is that there is a certain distance of hard road between them; so the important thing about Acts of Parliament is that there are certain passages of hard life to be covered before they are reached.

The true place of event or fact is to illustrate particular ideas and principles which govern the flow of life, to give concrete reality to what might otherwise appear as hazy abstraction; their usual place is to occupy the whole focus of attention with little or no reference to any underlying factor. Another analogy may help to make clear our meaning. Event and fact are as mill-wheels along the bank of the stream of life, set in motion by the immediate action of small side-currents which human endeavour has diverted from the main flood. Without the evidence of the turning of the wheel we should not be conscious of the power of the stream, nor should we know of the gradual flow of the main current were it not for the sudden drop of a small waterfall, after the damming of the water for the mill race. Our problem is to make the scholars increasingly conscious of the power and direction of the life-flow, and this can only be done by shewing its effects upon the obstructions in its course. At times the steady and continual turning of a wheel will tell of a wise and careful adjustment of the mill and its side stream to cope with the variations in the main current; at other times the wreckage of a mill will speak of attempts to make a small human construction withstand the full force of the torrent; and, again, at other times, the seemingly eternal pier of some stone bridge will withstand and divide the flow, causing little eddies and currents to fight madly for a place on the farther side of the bridge. All these obstructions, mills and bridges, are of importance only as giving evidence of the nature of the life-flow, and should not be treated as if they were important in themselves—as they are, for instance, to the archæologist.

It is of small moment as an isolated event that the scholar should learn that Columbus discovered a particular portion of the earth at a particular time; it is of immense importance that he should learn to appreciate the spirit which gave motive power

and significance to the act, and its determining force in the history of man's achievement.

Through the ages man's control over his environment to satisfy his needs gradually develops from something simple and crude to the highly complex social organisation of the present. The lines of this development are expressed by the building up of various more or less well-defined institutions, such as government, the formation of national frontiers, the division of labour, etc.; and in order to understand the relation which these institutions bear to life, it is necessary to trace their origin and growth in the primitive needs and developing desires of mankind. It thus becomes necessary for the child to begin by grasping the simple order of existence which characterises the dawn of civilisation, understanding the more obvious and individual modes of satisfying the need for food, clothing, shelter and intercourse. In other words, the child should live in imagination a life in direct touch with fundamentals; these at the present time are hidden beneath a complicated organisation, so that the connection between the breakfast table and man's control of nature to satisfy his hunger is remote and obscured. From this beginning the child should proceed along the lines which have led to the present stage of civilisation, using historical event to illustrate the forces at work and the obstacles in the path of the developing life. The underlying aim, therefore, in the scheme of History here proposed for school study is to represent the growth and interaction of the need of man and the possibilities of his environment so that the child may be helped to understand the bases upon which modern civilisation has been developed and, also, the capacities and limitations of social institutions to fulfil man's needs as they arise in the future.

The realisation of such an aim must, with our young scholars before adolescence, be limited by exigencies of time and by the intellectual capacity of the scholars, so that some selection of material is necessary. This selection, as we have shewn, is usually determined by the outstanding character of event or fact, with little consideration of its relative importance in the development of national life. In the following scheme the basis of selection has been the exposition of the ideas which

have governed the growth of the chief institutions of modern civilisation, and any particular event or fact is intended to be treated only in so far as it is significant of such growth. The Syllabus, therefore, works out not as a string of important events, but as groups of ideas and facts relative to important lines of development. The lines of development chosen are those which national experience has found convenient for the purposes of government. (See diagrams.)

The difficulty of summary form necessitates the use of familiar terms, such as Domesday Book, New Learning, etc., and it is anticipated that the teacher will not treat these as isolated and unexplained phenomena, but in close relation with the conditions out of which they arose.

The possibility that this may hinder the realisation of the unity of life is prevented by the concurrent study of such all-comprehending institutions as Government and the Church, and such inevitable overlapping as is indicated in Class IV. Section A, 3, compared with Section B, 1, will tend to safeguard against undue isolation and differentiation. A study throughout the proposed courses for the six classes of any one line of development indicated in the diagrams will afford the best example of the way in which the working out of this idea is anticipated.

Geography.—Some explanation of the place and treatment of Geography is necessary. The relation of history to geography is much the same as the relation of the flowing water to the banks and bed of the river. The importance of the land to the stream only stretches so far as it comes in contact with it, and therefore alters it, or is altered by it. Geographical fact (except in so far as it is scientific and, therefore, included in the Science Scheme, see Chapter XII.) can only be of educational value if it is related to the need of man either as satisfying or as being able to satisfy that need; the obvious order of presenting geographical fact is therefore determined by the growth of man's needs and his attempts to satisfy them—that is, by history. We demand, therefore, that geography and history should not be correlated in any superficial or accidental sense, but that they should amalgamate to form *one* course of school study; both are "developmental," both are essential, in the same way as both man's labour and the earth's possibilities are essential to

the production of food. It is not intended by this procedure that the geographical fact, whether in fact or in idea, shall be neglected; only that it shall be realised in its true setting and relation, where alone it can have any real and vital significance. It may be objected that such a course will leave the children ignorant of much necessary geographical information which it would only be possible to give them in a separate course of study. This is by no means the case. There is no reason why quite as much geographical material shall not be included, but it will be treated differently. Thus it is true that the scholars of Class V. will not "know" the railways of the British Isles, but why should they? If, for example, we suppose, in our treatment of History, that Class V. are capable of understanding the simpler life of the Mediæval period, we cannot logically at another hour of the day suppose that they are capable of grasping the complexity of life in the nineteenth century which gave us our railways. In so far as the children of such age know anything of railways from their everyday life, they accept them merely as facts, incomprehensible to them except so far as they correspond to the simpler modes of travel, the development of which they have traced through history. The difficulty which children find in understanding the early stages of the development of civilisation is increased by the ordinary course of geography, where unrelated facts of the Present are emphasized, which the child inevitably projects back to the period he is studying in history. The idea that the child understands the Present, and by selection can reconstruct the Past is entirely false, even if such a reconstruction were of any real value in primary education. The only age that a child does *not* understand is the Present. The aim of teaching history should be not to reproduce the Past, but to produce the Present.

The geographical knowledge which is acquired in such a scheme as is here presented is a grasp of the principles which have governed the development of the earth by man in the pursuit of his ends, and the effect of geographical conditions in modifying or developing man's desires; herewith the scholar also gains a knowledge of such topographical facts as represent dominating influences in the growth of life at the present day,

and these are facts worth knowing in the name of geography.

Language.—Such a scheme obviously involves the development of language and literature in so far as it moulds or is the outcome of the development of civilisation. The study of such influences upon language as increased facility of communication, the contact of foreign peoples (the Norman Conquest breaking down inflections), the invention of printing, and the revival of classical learning naturally find a place as history, and are, therefore, placed in this syllabus under the heading Arts and Learning.

The study for these five years centres round England, since England is the sphere of modern civilisation in which most of our scholars are called upon to play their part, but other parts of the globe will enter largely into the course as international relations become more important. In the highest class, of necessity, provision is made for the study of current topics and events of importance. And here also for the first time our scholars can open up what we may fairly call the *study* of history in the academic sense. Hitherto they have "lived" it, but without any definitely conscious effort at reconstruction. But now we can expect them to take either a current topic or one of an earlier period, and after a somewhat detailed study interpret it in an attempt at vital reconstruction. The reader can consult Hilaire Belloc's volume called *The Eye Witness* for illustrations of this method.

Reading Material.—Three separate kinds of reading matter are required. (i.) *Books purchased by each scholar.* An atlas (Bartholomew's *Comparative Atlas*) with a similar book of reference for names and dates, Frazer's *Summary of English History*. This last is not introduced until Class VI., for it is only at that stage that the scholars can reason by reference to sequence of dates. If for the period taken by any class we can find a work of real literary merit at a modest price we also adopt it as a class text-book (e.g., Green's *Short History*, part 4, in Class VIII.). But such a book is only treated as a supplement to the syllabus, not as a means of "learning" the period.

(ii.) *The Class Library.* More importance is attached to providing in the Class Library (see pp. 70, 73, 75, 78, 80) an

adequate variety of material which the scholar can consult, both during lessons and at home. The teacher often supplements what the school provides from his own shelves; others are borrowed from a public library and elsewhere. These include not only school text-books (such as C. L. Thomson and Tout), but romances, chronicles, books of poetry, guide-books, pictures and other illustrations.

(iii.) *Books of reference for the teacher.* Quite apart from material accessible to the scholar, the teacher needs to consult more advanced works dealing (1) with educational principles underlying this field of pursuits, (2) with specific topics of the syllabus. Many of these advanced books may be placed also at the scholars' disposal for a short period, especially as regards illustrations (for example, drawings in Clark: *Mediæval Military Architecture*).

To illustrate the extensive use made of these books we give a full list of those in use for Classes III. and IV. (see pp. 70 and 93). For the classes above only a few references are supplied owing to lack of space.

Source Books. The various sets of Source Books published by H. Marshall, A. & C. Black, Bell & Sons, as well as more advanced Source Books, such as Robinson's *History of Western Europe* with "Readings," are included in the Class Libraries.

Division of Periods.—It is understood that the whole course of study is only divided into its present sections to meet the practical exigencies of the particular school and classes for which it is planned. In all probability, the material in several cases will be too much to be covered within one school year, and in every instance there is likely to be modification and development during the treatment of topics in any individual class. The only two points fixed in such a scheme are the beginning and the end. As soon as the scholar's interests and instincts are sufficiently awake for him to become conscious of the struggle of man to bend nature to satisfy his needs, the beginnings of history will afford material for the study of the primitive forms of that struggle. When the child is launched forth into the world the development of that struggle should have reached the present time with which he will have to deal;

between these two points the course should be planned in such a way as experience proves most convenient.

Arts and Crafts.—Many schools now aim to bring geography and literature into some relationship with the syllabus of history, but a novel feature of this syllabus is the extension of the same principle to art and craft work. We give, first of all, the Humanities syllabus, with two chapters supplying illustrations of the treatment of this syllabus followed by Classes III. and IV. in more detail; then the scheme for arts and crafts-work is appended, with an introduction showing the principles on which this is related to the syllabus in history.

Local History. It will be seen that use is made of local history and local geography in Class III.; in subsequent years topics of local interest are introduced into the syllabus as occasion serves. We recognise to the full the importance of cultivating at school a sentiment of attachment to city and neighbourhood (see p. 11), and regret that we do not yet possess for Manchester such an admirable book for young citizens as is provided for Todmorden (Holden's *History of Todmorden*, Man. Univ. Press, 1912) and for other towns. But it is a mistake to place on local history a burden which it cannot bear. The development of national institutions can well be illustrated thereby, especially in Class VIII., where local government claims a prominent place. By this time the scholars are able to apprehend the interaction of a central with a local authority; and they can readily be enabled to feel some sympathy with the reviving spirit of civic patriotism which is gaining an increasing hold on our communities.

NOTE.—In the following Syllabus the letters indicating the sections A, B, C, etc., have no reference whatever to the order in which the various topics are treated in class. Sections are often dealt with in intimate connection with one another, and order of treatment is often determined by the natural interests of the children at the time.

SYLLABUS OF THE HUMANITIES COURSE, CLASSES IV. TO VIII.

(For Class III. see p. 82.)

In this Syllabus italic printing is used for ideas which are mainly geographical. This should be interwoven with the historical matter at the most convenient point for their demonstration. Divisions A, B, etc., refer to the main topics mentioned in the diagram on p. 59.

Class IV. (1066—1485).

A. SOCIAL DEVELOPMENT.

(i.) Manor House and Manorial Life. Manor Village (illustrated from Albert Grelley and the Manor of Manchester).

(ii.) Baronial Castles and Castle Life (illustrated from Lancaster Castle and Roger of Poitou).

(iii.) Rise of Towns round Monastery and Castle.

Development of Community Round Castle. (Usually alongside Monastic Community.)

Growth of Rivalry between Castle and Monastic Parts of Town.

Life in a Town. (Beginnings of Plan-making and Map-making.)

Town Charters. Trading between Towns.

Administration of Justice. Food Supply.

(iv.) Development of House. Domestic Customs (*cf.* A 1).

(v.) Learning and the Arts.

(1) Literature.

(a) Troubadours: Ballad Poetry. (b) Mystery and Miracle Plays (see Guilds). (c) Chaucer. (d) Langland.

(2) Architecture. Tapestry. Stained-glass Windows.

(vi.) Church.

(1) Story of Crusades.

(a) Peter the Hermit. The First Crusade. Knights Templars and Hospitallers. (b) Richard Cœur de Lion and the Third Crusade.

(2) Monks and Monasteries.

(a) S. Benedict and the Western Monks. (b) Description of Monastery. Plan and Pictures of Monasteries. (c) Life of S. Anselm. (d) Life of Becket. Pilgrimages.

(3) Story of the Friars.

(a) Life of S. Francis of Assisi. (b) Friars in England.

(4) The Lollards. Wiclif.

B. AGRICULTURAL DEVELOPMENT AND TRADE.

(i.) Growth of Trade. Guilds (not chief occupations).
Fairs, Markets, etc.

(ii.) Black Death.

Effect on Population and Occupations and Conditions of Livelihood.

(iii.) Peasants' Revolt.

C. GOVERNMENT AND CASTE.

(i.) England under a Strong King: William I.

(a) Rebellions at Exeter and in Yorkshire. (b) Hereward the Wake. (c) Story of Conquest. *Illustrations of Means of Travel. Harold's March South. Intercommunication between England and Normandy. Geographical Aspect of War Suggested (Hastings, Hereward).* (d) Domesday Book.

Parcelling out of Land. Enslavement of the English and Increased Development of Land.

(ii.) A Time of Misrule in England.

(a) Effect upon Life of the People. (b) Wars of Stephen and Matilda.

(iii.) *The Great Charter.*

(a) John. (b) Stephen Langton. (c) The Charter. *Beginnings of Conception of Government. How a King can be Controlled by his People.*

(iv.) Simon de Montfort.

Failure of Absolute Monarchy: Growing Consciousness of Power in People. Geographical Aspect of Warfare (Severn Valley). Towns Represented in Parliament. (Towns Concerned and Difficulties of Obeying Writs: Rough Map.) Friars' Influence upon Town Life.

(v.) Scotland's Fight for Freedom.

(a) Story of Wallace. (b) Story of Robert Bruce. *Development of the Scottish Nation. Border Warfare. Results of English Conquest in the Lowlands. Geographical and Historical Causes of Enmity with England. Geographical Aspect of the Wars (Bannockburn, etc.).*

- (vi.) The Struggle of the Welsh People. *Geography of the Borders and Border Counties.*
- (vii.) Wars with France.
- (a) Edward III. and the Black Prince. *Development of Foreign Trade (Flanders, Wool, Sheep). French Wars. Geographical Aspect of Warfare (Crecy, Calais, etc.).* (b) Henry V. A National Leader. *Geographical Aspects of this War.* (c) Jeanne d'Arc (see Chapter XI.). Need for a National Leader and Revival of the National Spirit.
- (viii.) *Warwick the Kingmaker,*
Effect of Internal Warfare upon the Country.
Further Development of Towns. Influence of Internal Warfare. Guilds and Charters.

READING MATERIAL (see p. 65).

(i.) In Class IV. the only text-book in use is Bartholomew's *Comparative Atlas* (used also for the Science syllabus).

(ii.) The Class Library contains a variety of books which we find our scholars enjoy to read in their leisure time. Some of these books bear directly on the Humanities Scheme—as *Social Life in England* (Black), *Hereward the Wake*, *Ivanhoe*, *The Talisman*, etc. Others deal with Geography, and are much appreciated when illustrated.

Nature Science books, copiously illustrated, are great favourites. In addition to the books read in the Literature course (see Chapter IX.) our children delight to read fairy stories, stories of children, adventure stories, and legends and myths.

In addition to the books of the Class Library the children are allowed access to many books mainly intended for the teacher's use. Those in the following list marked by an asterisk are placed for a time on the shelves of the classroom for the scholars to consult.

(iii.) *Books of Reference for the Teacher:—*

**Anglo-Saxon Chronicles* (trans.): *Geoffrey de Vinsauf, *Chronicles of the Crusade; The Crusades (History of Nations Series); History of the Crusades*, Cox: **Mediæval England*,

Bateson; **Highways of History*, Nelson, Parts III., IV.; *Illustrated History*, Frazer; **History of England*, Knight; *Social England*, Traill; **Social Life in England*, Vols. I., II., Finne-
more; *English History from Original Sources*, Frazer; **Portfolios of Drawings*, Horace Marshall—(a) *Social Life*,
(b) *Domestic Architecture*, (c) *Ecclesiastical Architecture*;
**History of England*, Gardiner; **First History of England*,
C. L. Thomson; **Illustrated History*, Fletcher & Kipling;
**Source Book of English History*, Kendall; *Local Antiquities*,
Morris & Jordan; **History of Lancashire*, Rhodes; **English
Illuminated MSS.*; **Catalogue of MSS.*, Rylands Library;
**Illustrations of the Bayeux Tapestry*; **Guide Book to Kirk-
stall Abbey*; **Guide Book to Westminster Abbey*; *History of
Architecture*, Bannister; *Select Charters*, Stubbs; *Growth of the
Manor*, Vinogradoff; **Mediæval Military Architecture*, Clark;
Life of Anselm, Church; *Coming of the Friars*, Jessop; *Eye
Witness*, Belloc.

Class V. (1485—1603).

A. CHURCH. THE REFORMATION.

(a) Mediæval Church and Need for Reform. (b) Luther
and Reform Abroad. (c) England and Protestant-
ism. Dissolution of Monasteries. Latimer and
Cranmer. First and Second Prayer Books. Act of
Uniformity. Catholic Martyrs. (d) Reaction.
Protestant Martyrs. (e) Elizabethan Settlement.
Act of Uniformity. (f) John Knox. (g) Counter
Reformation. Jesuits. (h) Religious Life in Six-
teenth Century.

B. ARTS AND LEARNING.

*Renascence in Europe. Italy as Centre. Centres of
Learning and Commerce in Europe. (Survey of the
Map of Europe, three or four Lessons.)* (a) Classics.
(b) Philosophy and Religion. (c) Discoveries.
*Maps. Fairly Full Treatment of the Then Known
World.* (d) Foreign Travel for Study and
Recreation.

(i.) Inventions.

(a) Printing of Caxton. (b) Mariner's Compass.
(c) Gunpowder.

(ii.) New Learning.

- (a) Life of Sir Thomas More and his Friends. (b) Henry VIII. Cardinal College. (c) Schools and Colleges.

(iii.) *English Literature.*

- (a) Poetry: Spenser. (b) Prose: Lyly, Sidney, Bacon, Hooker. (c) Novel and Drama: Early Novelists: Marlowe, Shakespeare. Theatre.

(iv.) Architecture. Stained Glass.

- (v.) Art: Holbein. Italian Art: Raphael, Titian, etc.

C. Omitted (not sufficiently important).

D. AGRICULTURE.

Change of Corn-growing Land into Pasture.

E. COMMERCE.

- (i.) Discoveries. (Compare Scheme of Geography for this Class.)

- (a) Under Diaz. (b) Vasco de Gama. (c) Christopher Columbus. (d) The Cabots. (e) Vespucci. (f) Drake and other Elizabethans.

(ii.) *Growth of Commerce.*

- (a) Under Edward IV. (b) Under Henry VII. *Growing Power of the Merchant Princes (comparison with Italy).* (c) Under Elizabeth.

F. POLITICS.

- (i.) Henry VII.

(ii.) Henry VIII.

- (a) Wolsey. (b) Thomas Cromwell.

(iii.) Elizabeth and Mary Queen of Scots.

- (iv.) Elizabeth and War with Spain. *Catholic and Protestant Europe Geographically Considered. Rise of English Seamanship. Effect upon England's Position in Europe.*

(v.) Elizabeth and the State.

- (a) House of Lords and House of Commons. (b) Army and Navy.

(vi.) England under Elizabeth.

- (a) Society:—Nobility, Professional Class, Middle

Class, Peer. *Growth of Commerce: Advancement of the Middle Class.* Poor. (b) Houses, Dress, Amusements.

READING MATERIAL.

- (i.) The only text-book used in this class is Bartholomew's *Atlas*.
- (ii.) Among books in the Class Library are the following :
The Story of Lancashire, The Swiss Family Robinson; C. L. Thomson, First History of England, Tom Brown's School Days, In Tudor Times, The Black Arrow, The White Company, Westward Ho! Morte d'Arthur (selections), *Stories from Chaucer; Scott, Kenilworth; Hutton, The Household of Sir Thomas More; Hakluyt's Voyages.*
- (iii.) Among the teacher's books of reference:—Traill's *Social England; Black, Source Books of English History, II., III., IV.; Chronicles of Richard II.; Rhodes, School History of Lancashire; Stubbs, Select Charters; Knight, History of England; Bateson, Mediæval England; Fletcher, History of Architecture; Marshall, Illustrated History—Tudor Period; Jacobs, Story of Geographical Discovery; S. R. Gardiner, Civil War; Seebohm, Era of Protestant Reformation; Creighton, Age of Elizabeth.* (Some of these are lent out to scholars.)

Class VI. (1603—1715).

A. CHURCH.

(i.) Puritanism.

- (a) Puritans and Hampton Court Conference. (b) Puritan Writers: Milton, Baxter, Bunyan. (c) Pilgrim Fathers.

(ii.) English Churchmanship.

- (a) Archbishop Laud. (b) Bishop Andrewes. (c) George Herbert. (d) Prayer Book of 1662. (e) Non-jurors.

B. ARTS AND LEARNING.

(i.) Art.

- (a) Dutch School: Van Dyck, Rembrandt. (b)
 Architecture: Inigo Jones, Wren.

(ii.) Science.

- (a) Sir Francis Bacon and the Beginnings of the
 Study of Natural Science. Royal Society. (b)
 Sir Isaac Newton.

(iii.) Literature.

- (a) Poetry: Milton, Dryden. (b) Prose: Bunyan,
 Milton. (c) Drama: Jonson, Beaumont and
 Fletcher.

C. LOCAL GOVERNMENT. TOWNS. Development of Freedom: Separate Entity, e.g., Hull. Check upon Towns, e.g., Demolition of Walls. Taxation (Ship Money). *Life and Occupations of Various Classes in the Kingdom, e.g., the Nobility, the Yeomanry, the Poor. England during the Civil War. Towns, etc.*

D. AGRICULTURE AND INDUSTRY.

- (a) Woollen Trade in Eastern Counties. (b) Improvement
 in Farming. Reclaiming the Fens.

E. COMMERCE AND COLONIAL EXPANSION.

(i.) Colonial Expansion. *Growth of Idea of Colonisation.*

- (a) East India Company. (b) Virginia Company.
 (c) Mayflower.

(ii.) *Navigation Act.* Dutch Wars and Protectorate. *Rise of England as the Carrying Nation for the World.*

(iii.) New England Colonies: Jamaica.

F. POLITICS.

- (i) Theory and Claims of James I. *Government. Dual Monarchy. Two Countries under One King. Geographical Difficulties. Study of England from Point of View of Manufacture and Population. Relations with Spain. Growth of Parliament. Gunpowder Plot.*

(ii.) Struggle between Crown and Parliament.

- (a) Buckingham. (b) Eliot. (c) Personal Govern-

ment of Charles Wentworth. (d) Pym and the Grand Remonstrance.

(iii.) The Great Rebellion.

(a) First Civil War. (b) Army v. Parliament. (c) Second Civil War. (d) Events Leading to the Execution of Charles I.

(iv.) The Protectorate.

(a) Conquest of Ireland and Scotland. (b) The New Despotism. (c) Death of Cromwell. (d) Richard Cromwell. Rule of the Army. (e) Monk and the Declaration of Breda.

THE LATER STUARTS.

(a) Restoration of Charles II. and Clarendon. (b) Cabal. (c) Whig and Tory. (d) Declaration of Rights. (e) Scotland and Ireland. *Character of the Scottish Country: Killiecrankie and Glencoe. Colonisation of Ireland: Ulster, Queen's County; Relations of Different Parts of Ireland with England.* (f) The Jacobites. (g) Marlborough. *The Low Countries. The Geographical Divisions of Europe.*

Additional Section.—Manners and Customs of the Seventeenth Century: Dress, Armour, Amusements.

READING MATERIAL.

- (i.) Frazer's *Summary of English History* is added to the *Atlas* brought from Class V.
- (ii.) The following are examples of books in the Class Library:—*Pepys Diary*; Bunyan, *Pilgrim's Progress, Holy War*; R. L. Stevenson, *Kidnapped and Catriona*; Defoe, *History of the Plague*; Johnstone, *Oliver Cromwell (People's Books)*; Milton, *Poems*; Gardiner, *Students' History of England*, Vol. II.; Macaulay, *History* (three vols. Everyman's Library); Ward, *English Poets*, Vol. II.; Blake, *English Seamen Series*, etc.
- (iii.) Traill and other books mentioned for Classes III. and IV. are also of use here. In addition for this period the following are especially useful:

Carlyle's *Cromwell*, Gardiner's *Atlas of English History*, Hunt & Steven's *History of the English Church*, Roger's *Holland and Scotland (Story of Nations Series)*, *Gustavus Adolphus* and *Louis XIV. (Heroes of the Nations Series)*.

Class VII. (1715—1815).

A. CHURCH.

(i.) Growth of Religious Toleration.

(ii.) Methodist Revival: Wesley.

(iii.) Evangelical Revival: Foreign Missionary Societies.

B. ARTS AND LEARNING.

(i.) Art.

(a) Reynolds and the Royal Academy. (b) Architecture. Revival of Gothic Architecture. (c) Music. Handel.

(ii.) Science.

(iii.) Literature.

(a) Poetry: Pope, Burns. (b) Prose: Dr. Johnson, Addison, Steele, Swift, Gibbon. (c) Novel and Drama: Sterne, Smollett, Goldsmith, Sheridan, David Garrick.

C. LOCAL GOVERNMENT. Sudden Growth of Towns without Corresponding Growth of Local Government:—Result: Housing and other Health Legislation.

D. (i.) Agriculture: Influence of Holland. Improvements in Farming.

(ii.) Industry: Industrial Revolution. *Application of Science to Industry. Geographical Influence of Changes in Forms of Industry. (Development of the North of England.) Development of Means of Transit. Consequent Development of Country Districts. The Factory as a Centre of Town-life. Effects on Agriculture: Comparison with Industrial Development in Germany.*

(a) Inventions. (b) Development of Means of Transit. (c) Factory System.

E. COMMERCE AND COLONIAL EXPANSION.

Development of Colonies. Inquiry into the Civilisation and Occupations of the Peoples of India. Character

of the English Government in India, and its Influence. Canada as an Example of an Undeveloped Country ready for Colonisation. Relations of such a Colony to the Motherland, beginning from the Thirteen Colonies and the War of Independence.

- (i.) India. East India Company. Dupleix, Clive, Warren Hastings.
- (ii.) Canada. French and English Rivalry. Wolfe and Quebec. (See F. iv. b.)
- (iii.) American Colonies and War of American Independence. George Washington.

F. POLITICS.

- (i.) Jacobite Rebellions, 1715—1745.
- (ii.) French Revolution. *France. Condition and Occupations of the People in Different Strata of Society. Comparison of French and English Government. Discussion of Principles of Government.*
 - (a) Relation of France and America. Lafayette.
 - (b) Causes of Revolution. (c) Work of Voltaire and Rousseau. (d) Reign of Terror. (e) Downfall of Robespierre. (f) Effect upon England. Burke, Pitt, Fox. (See iv. c.)
- (iii.) Napoleonic Wars. *Europe as a Field of Battle. Physical Aspect of Europe from Point of View of Warfare and of Government.*
 - (a) Early Life of Napoleon Buonaparte. (b) Life in Corsica. Effects. (c) Italian Campaigns. (d) Relation with England: Battle of Nile; Nelson, Trafalgar. (e) Peninsular War. Wellington. (f) Fall of Napoleon. Waterloo. Death.
- (iv.) Home Politics.
 - (a) Walpole's Ministry and Fall. (b) William Pitt, Lord Chatham. (c) Ministry of the younger Pitt.
- (v.) Colonial Expansion. (See E.)

READING MATERIAL.

- (i.) Text-books as in Class VI.
- (ii.) *Examples of Class Library books.*—Macaulay, *Essays*; Clive, Hastings, etc.; Wesley, *Journal* (*Everyman Library*); Hawke, *English Seamen Series*; Southey, *Life of Nelson*; Frankfort Moore, *Jessamy Bride*; Thackeray, *Esmond*, *Virginians*; Dickens, *Tale of Two Cities*; Goldsmith, *Works*; Addison and Steele, *Essays*; Ward, *English Poets*, Vol. III.; Ludlow, *War of American Independence*; Mrs. Gaskell, *Mary Barton*; *North and South*.
- (iii.) Carlyle, *French Revolution*; Bourrienne, *Life of Napoleon*; Holland Rose, *Ditto*; Mignet, *French Revolution*; Pitt and Walpole, *English Statesmen Series*; Earl Barnes, *Studies in American History*; Sir W. Hunter, *History of the Indian Peoples*; Gibbin, *Industrial History of England*; Young's *Tour*; Saintsbury, *History of Manchester*; Traill, etc., as in earlier classes.

Class VIII. THE NINETEENTH CENTURY (to include present-day national and political movements).

A. CHURCH.

- (i.) Catholic Emancipation Act.
- (ii.) Repeal of Test and Corporation Acts.
- (iii.) Church Revival and Reform. Tractarians.
- (iv.) Protestant Nonconformity.
- (v.) Education. National Schools, etc.

B. ARTS AND LEARNING.

- (i.) Art.
 - (a) Painting: Turner, Pre-Raphaelites, National Gallery. (b) Architecture: Revival of Gothic. Influence of Modern Modes of Construction.
- (ii.) Science. Development of Natural Science. Influence upon Commerce. (See E ii.)

(iii.) Literature.

- (a) Poetry: Lake Poets, Tennyson, Browning. (b) Prose: Macaulay, Scott, Lamb, Carlyle, Ruskin, R. L. Stevenson. (c) The Novel. (d) The Drama: Shakespearean Revival, Modern Drama.

(iv.) Education: New Universities, Elementary and Secondary Schools.

C. LOCAL LIFE AND GOVERNMENT.

- (i.) Attempts to Satisfy New Needs Developed in Last Century. *Practical*: Sanitary Offices. *Ideal*: Garden Cities.

- (ii.) Abnormal Growth of Competition and its Results. Food adulteration. Extension of Wholesale Trade: Limited Companies, Monopolies, Trusts. Trades Unions. Municipalisation of Industry.

D. AGRICULTURE. Influence of the Employment of Machinery. Agricultural Depression.

E. INDUSTRY AND SOCIETY.

- (i.) (a) New Poor Law. Recent Developments. Poor Law Commission: Labour Exchanges (see F, ii.). (b) Development of Means of Communication: Steamboat, Railways, *Principal Canals, Railways (Home and Continental) and Sea Routes*.

(ii.) Commerce.

- (a) Repeal of Corn Laws. Free Trade: Cobden and Bright. (b) Influence of Natural Science.

(iii.) Colonial Expansion: *Exploration of Australia; Opening-up of Africa; Geographical Reasons for Selection of Places for Settlement as Colonies.*

- (a) Australia, Cook's Voyages. Settlement of Colonies. (b) African Discoveries: Mungo Park, Livingstone, Baker, Stanley. (c) South Africa. (d) Canada. Expansion to the Great West.

(iv.) Industrial Legislation. (See i (a), Factory Acts, etc.)

F. POLITICS.

- (i.) Influence of French Revolution. *General Influence of War on Trade. (French Revolution) Reform*

Bills; Conditions of Town-life. Geographical Reasons for Rise of Popular Movements in the North. Reform Bills: 1832, 1867, 1884, 1913.

- (ii.) Chartist Movement.
- (iii.) National Movements.
 - (a) France. (b) Greece. (c) Italy. (d) Germany.
- (iv.) Abolition of Slavery (see viii.). *Relation of Slavery to Trade.*
- (v.) Prison Reform.
- (vi.) Relations with the 'East.
 - (a) Turkey and Crimean War. (b) China. (c) Awakening of Japan. (d) Afghanistan. (e) Indian Mutiny. *Conflict of Eastern and Western Civilisation (discussed with the Indian Mutiny and Chinese War). Effect of Western Ideas as seen in the Japanese Renaissance.*
- (vii.) Franco-Prussian War. *Geographical Bases of National Enmity. Significance of a Frontier.* (Comp. Class IV., c, v., vi.)
- (viii.) Relations with America, of North and South. Abraham Lincoln.
- (ix.) Egypt and the Sudan. *Some Account of Early Civilisation and its Effect upon the Rise of Western Civilisation.*

READING MATERIAL.

- (i.) As in Class VII.; *Green's Short History*, Part. IV.
- (ii.) *Examples of Class Library Books.* Macarthy, *Short History of Our Own Times*; Trevelyan, *Garibaldi's Defence of the Roman Republic*; Morley, *Life of Cobden*, *Life of Gladstone*; Brooks, *Abraham Lincoln*; Temple, *Life of Sir H. Lawrence*; Kingsley, Weyman, Churchill and George Eliot and other novelists; Fitchett, *Fight for the Flag*. A set of popular descriptions of the Colonies is being collected, Ward's *English Poets*, IV.; selected volumes of Byron, Tennyson, Wordsworth.

- (iii.) Marryat, *Remaking of Europe*; Holland Rose, *Rise of Democracy*; Hutchinson, *Factory Acts*; Stanley, *How I Found Livingstone* and other books of travel; Peel, *English Statesmen*; Church, *Oxford Movement*; de Gibbons, *English People of the Nineteenth Century*; Ruskin, *Unto this Last, Crown of Wild Olive*.

E. CHRISTABEL DICKINSON.

JAMES SHELLEY.

CHAPTER V.

CLASS III. (AGE 9-10): SYLLABUS IN DETAIL.

[NOTE.—In accordance with the views expressed in a preceding chapter on the teaching of the Humanities, an attempt has this year been made in Class III. to bring history and geography into closer relationship to the scholars' own experiences. The aim in view, therefore, has been to let the children experience the facts of history and geography rather than memorise them; in a sense, to live through the experiences which have culminated in the event. Incidentally, however, the event is remembered, and the class examinations which the scholars take have shewn that their attainment as regards regular school learning of history is quite up to standard.]

In a broad sense the provision of food, clothing and shelter (compare p. 58) constitute the main social problems in the solution of which our scholars will have to take their part. These are also interests which are essentially predominant in early childhood. The method of approach has therefore been to present these same problems to the scholar in their simplest aspects by making use of his own interests—to help him to fresh and more complete experiences by utilising those which he already possesses.

To this end handicrafts and the arts of reading and writing have been linked up with the humanities. The dominant characteristic of the child of nine is the impulse "to do." The boy or girl of this age is an essentially practical person. He wants no abstract presentation of subject-matter. He gets at the business through his fingers.

It may be interesting to *hear* how the Romans built their roads and walls, but it is an altogether different thing when the scholars themselves as a band of Roman Legionaries attack the problem with bricks and stones.

The value of recognising this dominant attitude towards life has been clearly manifest in the year's work with this class. The girls (and some boys)¹ have been delighted to work tapestries in silk and wool as the Saxon women did in years

¹Other boys objected that the Saxon *men* did not embroider tapestries; hence they did not find the same practical purpose in their handicraft.

gone by. Boys and girls have made weapons and coats of mail; as Britons and Romans, Saxons and Danes, they have engaged in deadly encounters. Scope has constantly been given for characteristic expression; and, when necessary, all "properties" have been designed and worked out by the scholars themselves.

This attempt to let the class combine all the subjects in one *living* experience has helped to meet the very real difficulty of speech-training, especially one branch of it, viz., written composition. We recognise that children, in common with adults, must act from a realisation of sensible purpose if good work is to result. But whilst many educators are willing to accept the principle, and recognise accordingly that children's written composition must be the outcome of a real motive, they do not always find it easy to discover exercises sufficiently purposeful. At the beginning of the year our scholars asked if they might keep history story-books, which later might be taken home to fathers and mothers who would be interested. Such books have been kept and a motive has been found for Art work in illustrating them. It is interesting to note in these books that towards the end of the year the children have not been content merely to give an account of a particular event. They write as eye-witnesses or as characters who have actually taken part in the incident. They have been delighted to make reed pens, to keep chronicles of events, to write letters from Abbey to Abbey as the monks did long ago. Dramatic sketches, which at first were purely oral, have towards the end of the year begun to take written form, this being the outcome of a suggestion by the children themselves, that it would be better "if we always remembered the best words." It is interesting to find that this work has not been confined to the classroom; an example of a play written and acted by the scholars when left to themselves, out of school hours, is given in Appendix I.

Another development has been the awakening of the sense of time-relationships. Earlier in the year the scholars were content with "A long time ago"; it was sufficient for an event to be placed somewhere in past ages. Now that we are reaching the end of the year the question of when it happened, the

relation of one event to another, comes frequently. To meet this fresh need the children have begun to compile Time Charts, which satisfy their vague sense of past time. (Compare Class IV., p. 97.) These are made as pictorial as possible, and here again the connection is made with the Art work. This not only meets the need of the moment, but forms an excellent method of recapitulating past work.

For reasons explained elsewhere in the volume there has been no attempt at so-called correlation of poetry with History and Geography; the Class Library (see p. 65) contains books of travel, biography, poetry and romance bearing on the pursuits for the year, and these have been eagerly read in school and out. Whenever possible, original sources have been used (the teacher reading a passage from one of the books mentioned below), and many of the more advanced scholars have made good use of the copy of the Anglo-Saxon Chronicle kept in the classroom.

The success or failure of a scheme of this nature cannot be rightly estimated on the results of a year's work; it can only be seen in its entirety when these children have passed up the school to the higher classes. And the children's response has been such that it is thought sufficient warrant for continuing the same methods. One factor which has contributed largely to the apparent success of the work this year has been the freedom from the restraint of a rigid time-table. Once a problem has been proposed the time devoted to its working-out has been entirely dependent upon the sustained interest of the children. (Compare p. 4.)

HUMANITIES, WITH ART AND HANDICRAFTS.

GENERAL PLAN:—

I. Humanities (*i.e., History and Geography combined*) in eight sections, as sketched in detail below.

II. Handicrafts arising out of these eight sections, involving:

- (a) Clay-Modelling, *e.g.*, Primitive Pottery.
- (b) Paper Modelling.
- (c) Simple Woodwork, requiring only saws, nails, and glue.
- (d) Coarse Sewing, including decorative work.
- (e) Simple Basketry.

III. Illuminated Lettering and Copying of Samples of Chronicles, taken as exercises in handwriting.

IV. ART.—(a) Imaginative and pictorial drawing of geographical, historical, and literary scenes. Occasional copies from flat illustrations of buildings of historic interest, antiquities.

(b) Nature and object drawing in mass or outline. Nature drawing in several colours or silhouettes in ink with a brush. Simple flowers, leaves, fruits, vegetables, and insects, suitable objects suggested by the syllabus in History and Literature. Memory Drawing.

(c) Rhythmic arrangements of motives suggested by work done under (b) and drawn from memory are used to form borders, corners, etc. In every case the design is for the decoration of some constructed object (*see* Handicrafts), and is properly planned out with a ruler.

Two harmonious colours, or different shades of the same colour, may be used either on a white or naturally tinted background.

(d) Plans of School-room, large objects, etc.

In addition to this scheme of associated pursuits, time is also taken for the following occupations under the head of Handicrafts:—

V. Making of articles suitable for gifts to parents (often at Christmas); articles for school use, *e.g.*, notice boards, wastepaper boxes, board-rubbers, etc.

VI. Clay-modelling connected with nature study.

SECTION I.—CELTIC BRITAIN.

AIM.—To consider problems relating to the land of Britain and to the manners and customs of the people who lived there before the Roman Invasion.

(Special aims arise out of each sub-section and each lesson of every complete Section.)

HISTORY AND GEOGRAPHY.

- (a) The expedition of Pytheas to Britain, 330 B.C.
- (b) The kind of country he found, undeveloped land, swamps, forests, and moorlands.
- (c) The people who lived there—the Celts.
- (d) Their homes. The choice of a home. British Camps and Settlements. Lake dwellings.
- (e) Occupations of the people. Means of life.
- (f) Methods of warfare.
- (g) Religious sites and customs.

ART AND HANDICRAFT.

(The Roman numerals refer to the divisions on p. 85.)

II. Model of a British village.

Model of a Lake dwelling.

Making of a coracle.

Making of early British weapons, war chariots, etc.

Modelling of primitive pottery.

Model of Stonehenge.

III. Each child keeps a "History Story-book," where accounts of the most interesting events are written down.

IV. (a) (See general scheme.)

N.B.—Throughout this section reference is made to local British camps and settlements, e.g., site of Mancenion (later Mancunium). The children pay frequent visits to the Museum, where they are able to see examples of Early British pottery, weapons, implements, etc.

SECTION II.—THE ROMAN CONQUEST OF BRITAIN.

AIM.—(a) Problems relating to conditions of Life during Roman rule in Britain. (b) To consider how Britain suffered and benefited from Roman rule.

SUB-SECTION A.—THE ROMAN INVASIONS.

- (a) Stories of the first and second invasions of Britain, interest centring round Julius Cæsar and Casivellaunus.
- (b) Britain from 54 B.C. to 43 A.D.

SUB-SECTION B.—ROMAN OCCUPATION OF BRITAIN.

- (a) Subduing of the South of Britain—defeat of Caradoc and Boadicea.
- (b) Subduing of people by building of forts. Agricola conciliates the tribes.
- (c) Roman roads. Reasons for road-making. Construction of roads. Results.
- (d) Trouble from the Picts. The Great Wall of Hadrian.
- (e) Effects of Roman rule on British modes of living, dress, house-building. The beginnings of agriculture and growth of villages.
- (f) Christianising of Britain. St. Alban.

II. Building of a fort. Plan taken from fort at Mancunium.

Making of a piece of Roman road in the garden.

Building of a Roman wall, showing towers and guard-houses.

Modelling of Roman galleys, armour, pottery, etc.

Designing and laying of a piece of tessellated pavement as used in Roman villas.

III. As in Section I.

(a) Scene painting.

IV. Copies of Roman Antiquities, etc.

N.B.—Visits paid to sites of Roman camps in the district, to the Museum and other places where Roman remains can be seen.

SECTION III.—THE ENGLISH CONQUEST.

AIM.—(a) To consider problems of conditions of life after the Saxon invasion of England.
(b) The effect of the invasion on the development of England.

SUB-SECTION A.—THE DEPARTURE OF THE ROMANS.

- (a) Why the Romans left Britain.
- (b) The state of Britain after their departure.
- (c) The coming of the Picts and Scots.
- (d) The coming of the Angles and Saxons. Story of Hengest and Horsa and Vortigern.

SUB-SECTION B.—THE EARLY HOMES OF THE ENGLISH.

- (a) Life in a Saxon farmstead. Necessity for finding means of subsistence for younger sons. Consequent wanderings of the Saxons. Their coming to Britain.
- (b) Geographical description to explain difficulties of invaders—the positions they chose for landing.

SUB-SECTION C.—THE ENGLISH BRITAIN.

- (a) Driving away of the Britons. Demolition of towns.
- (b) Choice of a home. Building of the village.
- (c) Occupations and sports of the men.
- (d) Occupations of the women.
- (e) Armour, dress, food of the people.
- (f) Methods of government. Town moot, hundred moot, folk moot. The Witan.
- (g) Development of the idea of kingdom and greater unity of action.
- (h) Religion. Burial customs.

II. Plans and models of Saxon farmsteads. Models of Saxon ships. (See B (a).)

Models of Early English village, houses, barns, etc. (See C (b).)

Making of all stage properties for a small play, illustrating the life of the Early English, *e.g.*, glee harps, drinking vessels, lamps, horns, weapons, byrnies.

Simple tapestries on sacking, worked in coloured wools. (See C (d).)

Modelling and making of agricultural implements, food utensils—in clay, wood and cardboard. (See C (c).)

Modelling of parts of a monastery, *e.g.*, arches, doorways. Making of reed pens. Monkish sandals, etc., for plays written by the children.

III. As for Sections I. and II. Variations on the simple story form in the third person. Children write as eye-witnesses of what they tell, as monks writing up the chronicles.

IV. (a) Scene painting, etc.

SECTION III.—THE ENGLISH CONQUEST—*Continued.*

SUB-SECTION D.—HOW THE ENGLISH BECAME CHRISTIAN.

- (a) St. Augustine and his band of monks in Kent.
- (b) The marriage of Edwin of Northumbria and the daughter of Ethelbert. Paulinus and the conversion of Northumbria.
- (c) The Irish Missionaries. Stories of Saints Aidan, Cuthbert and Dunstan. •

SUB-SECTION E.—MONASTIC LIFE. BEGINNING OF ENGLISH LITERATURE. •

- (a) Early English monastic settlements. Avalon (Glastonbury) and Streoneshalh (Whitby), Caedmon, Bede, Abbess Hild.
- (b) Later Benedictine monasteries.
- (c) Building of a monastery. •
- (d) Life in a monastery.
- (e) Development of the township from the monastery.

SECTION IV.—KING ALFRED AND THE FIRST STRUGGLE WITH THE DANES.

AIM.—To consider how England, under the leadership of a strong King, met the attacks of a new enemy. To discuss the developments under Alfred in times of peace.

SUB-SECTION A.—THE DANES.

- (a) Early homes.
- (b) Manners and customs.
- (c) First invasions of England.
- (d) Results. Difficulties attending agriculture. Union of the kingdoms of Northumbria, Mercia and Wessex to meet a common enemy.

SUB-SECTION B.—KING ALFRED.

- (a) Necessity for a strong King.
- (b) Boyhood of Alfred.

SUB-SECTION C.—HOW ALFRED MET THE DANES.

- (a) Buys off the Danes. Hostages.
- (b) Attacks and defeats them.
- (c) Alfred in Athelney.
- (d) Treaty of Wedmore. Gradual settlement of the Danes. Boundary disputes.

SUB-SECTION D. — ALFRED'S WORK IN TIME OF PEACE.

- (a) Equipment and training of warriors. Formation of a navy.
- (b) Educational work. His schools. Aid to literary men. To the Church. Asser. The Anglo-Saxon Chronicle.
- (c) Alfred's laws. The Wifan.
- (d) The growth of towns. Importance of a capital. Inter-communication with other countries. Development of fisheries.

II. Modelling of Viking ships, helmets, weapons, etc.
(See A (a).)

Preparation of parchment.
Making of Alfred's clock.
(See D (b).)

III. Keeping of monkish chronicles. Writing-out of laws, etc.

IV. (a) As in previous sections.

SECTION V.—THE SECOND STRUGGLE WITH THE DANES. ENGLAND UNDER CANUTE.

AIM.—To consider how England met the renewed attacks of the Danes. Why she failed to repel them. To find out some of the results of the Danish Conquest.

SUB-SECTION A.—THE SECOND DANISH INVASION.

- (a) The strength of England fifty years after the death of Alfred's sons. Fusion of English and Dane.
- (b) The incursions of the Danes in the reign of Æthelred the Redeless.
- (c) How Æthelred attempted to repulse them.

SUB-SECTION B.—THE DANISH CONQUEST.

- (a) Conquest by Sweyn. Flight of Æthelred. Edmund Ironside and Canute.
- (b) Reign of Canute.

SUB-SECTION C.—RESULTS OF THE DANISH CONQUEST.

- (a) Development of government with unity of kingdom.
- (b) Geographical conditions in relation to government.

II. Modelling of Danish and Saxon standards. The Golden Dragon of Wessex. The Raven.

Modelling of pieces of Saxon.

Architecture, *e.g.*, tower of St. Benet's Church, Cambridge.

III. As in previous section.

IV. (a) As in previous section.

SECTION VI.—EARL GODWIN.

AIM.—To consider Godwin's rise to power. His policy and his difficulties.

- (a) Early life as a swineherd. How he became known to Canute. Growth of power during the reigns of Canute and his two sons.
- (b) Godwin and Edward the Confessor.
- (c) Godwin and his sons outlawed.
- (d) Return to England. Attitude of the English people towards the house of Godwin.
- (e) Death of Godwin. Harold, Earl of Wessex.
- (f) The might of the sea. Formation of the Goodwin Sands.

Modelling of objects of historic interest relating to the periods.

Types of Saxon architecture
(continued).

- V. (a) As in previous sections.
- (b) Writing of plays and poems. Time chart compiled to meet need of children who begin to ask :
"When did this happen?"
"How long ago?"

VI. (a) As in previous section.

SECTION VII.—THE NORSEMEN.

AIM.—To consider the conditions of life in Normandy after Rollo's invasion (888 A.D.) to the time of the Norman Conquest of England.

- (a) The Norsemen at home.
- (b) In France. Rollo's conquests, 888 A.D.
- (c) The growth of power. Tyranny of the Roman barons.
- (d) William of Normandy. How he prepared to seize the English Throne on the death of Edward the Confessor.

II. Modelling of Norman castle.
Making of Norman weapons.

III. As in previous sections.
Play-writing continued.

IV. (a) As in previous sections.

The sections can be appropriately concluded by reading and story-telling from the life of Charlemagne.

READING MATERIAL.

No history or geography text-book is provided for the class as a whole. The following books are mainly of service to help the teachers' study; but some marked with an asterisk are placed on the shelves for the scholars to consult as required. Where a book is used only for one section the number of the section is indicated:—

J. R. Green, *The Making of England* (Sections I. and II.); Traill, *Social England*; J. R. Green, *The Conquest of England*; Stubbs, *Select Charters*; Gardiner, *History of England*; Sharon Turner, *History of the Anglo-Saxons*; Thrupp, *The Anglo-Saxon Home*; Jessop, *Coming of the Friars*; **Guide Book to Whitby Abbey*; **Guide Book to Glastonbury Abbey*; Rhodes, **History of Lancashire*; Scott Elliot, **Romance of Early Britain*; C. L. Thomson, **A First History of England*; Nelson, **High Roads of History, I. to IV.*; Horace Marshall, **Illustrated History, Early British period*; Bannister, *History of Architecture*; **The Anglo-Saxon Chronicle*; Sedgefield, *Beowulf*; Sara Meluish, **English History Illustrated from Original Sources*; **English Illuminated MSS.*; H. G. Marshall, **Stories of Roland (Told to the Children Series)*; *Charlemagne (Heroes of the Nations)*.

The scholars also use books in two other ways:—

(1) The Class Library contains a variety of books which we find our scholars enjoy to read in their own leisure time, such as Hans Andersen's *Fairy Tales*, *Stories of King Arthur*. They especially enjoy among these a few which have a definite bearing on their Humanities Scheme, such as *Puck of Pook's Hill*, *Rewards and Fairies* (Rudyard Kipling).

(2) They read and learn both poetry and prose for pure enjoyment as literature (see Chapter IX.), where a list of books at present in use under this head will be found. The reader will, however, observe that, so far as possible, all the books put within our scholars' reach are worthy of use as literature.

Poetry.—The poems selected are hectographed on to loose sheets, and these at the end of the term are bound up into a book by the scholars.

IDA SUDDARDS.

CHAPTER VI.

A TIME OF MISRULE IN ENGLAND: AN ILLUSTRATION IN METHOD OF TREATMENT.

[INTRODUCTORY NOTE.—Assuming the general principles of Chapter IV. we add here some of the specific features in the development of Historical ideas with children about ten years of age.]

Our scholars developing *with* History naturally have a different conception both of ideas and ideals from the adult, who looks on the past with "disenchanted eyes." History is the quarry from which the child takes material for the building of his habitation; that is to say, his present phase of life. In emphasising thus the child rather than the subject we adopt a treatment of History which may shock the expert historian by its lack of proportion and of logical development.

It seems clear that the main interests of our scholars at this age are practical ones, and so to them history should be a record of man's doings, of his practical achievements; and it is chosen as a branch among our school pursuits because it gives scope for the fulfilment of these impulses.

Briefly, then, our "aim" both in the selection of material and in our method is to enhance and to enrich personality by the provision of experiences from the past—putting these, however, on the child's level, helping him to play a real part in the drama; and this not merely as an actor on a stage, but as an intimate partner with the characters.

Material.—Without insisting pedantically upon the parallel between the child and the race, we find that mediæval history, following on the life of Roman and Anglo-Saxons in Class III., presents many characteristics which have some correspondence with the racial development of man. About the age of ten years the child, as we have said, is a "doer"—one who translates his emotions and perceptions in terms of action. In the playground, for example, he delights to triumph physically over his enemy. "I am the King of the Castle" in its many forms is the game which is typical of his mental attitude.

Argument and reason fail in their appeal, and the most satisfactory means of settling quarrels are to be found in a whole-hearted hand-to-hand struggle. A good example of this was seen in a discussion on the Trade Guilds, in which the class represented the characters. A certain merchant asked his Guild for leave to engage two apprentices and was refused; but the reasons against his request proved to be unconvincing, for the boy (representing the merchant) offered to fight each of the other merchants to show he was the best man, and therefore ought to have his way. Those periods of history which deal with the struggle between the weak and the strong—periods in which the best argument is with arms rather than diplomacy, periods of conquest and defeat—are the parts of History which sincerely appeal to our scholars of ten years. But mere indulgence of natural instinct as it arises is not the way to fullest development. The story must display these instincts modified—inhibited, may be—but at all events guided by reason, emotion and love of equity. Our scholars are expected to glean the accumulated harvest of wisdom which the ages have sown for them, and thus they are not at the mercy of their own little experiences alone, but can live with their heroes and learn those lessons which are allowed to few to learn at firsthand.

Method.—How, then, can we help our scholars to get the best out of the story of History? The main facts of History can be easily learned by the boy of average intelligence, but will he thus have extracted its virtue? Facts as facts are dead, and are so much mental lumber. What we strive to do is to help the child to feel the great struggle, the great doings of which the bare facts are but the outward records. It is of little value for a boy to know that Senlac was lost in 1066 unless he has learned the lesson that the Saxon and Norman learnt, unless he has rejoiced with the victor and sorrowed with the conquered. The necessary facts may be assimilated in a few weeks if necessary, but the building-up of character and the unfolding of life is a matter of progress through a lifetime.

The children should do the major part of the work themselves in order to fully project themselves into these remote circumstances. The teacher is there as a guide, a court of appeal, or as a director in some degree; he feels that his own academic interests

and longings must be subordinated to the desires of his scholars, and he should be at all times on his guard against forcing interest. What is often of great interest to the adult is of little value from the growing child's point of view, so the teacher has perhaps to acquiesce in a non-logical and often disproportionate treatment of the story. Interests do not need artificial stimulus; let the teacher give the right opportunity and the right interest will follow. By means of descriptions, pictures, visits to old buildings, reference to documents and books we help our scholars to live in the period with which they are dealing. They feel William the Norman's position; they experience the rebel quality of his (*i.e.*, their own) barons, and they find a way out by evolving expedients to meet their (*i.e.*, William's) difficulties. This is experience at second-hand, no doubt, but it is nevertheless vital. The aim, then, of helping the children to "live" their History explains partly the prominence given to the so-called Dramatic Method of teaching in this class. Once a boy feels it incumbent upon himself, as Henry I., to conciliate a rebel people he will not be deterred from appropriating such facts as he finds necessary in order to act his part more effectively. The sincere interest shewn in history when treated in this way will lead to much labour which otherwise would be difficult to obtain from children. In pursuit of knowledge wherewith to solve his problems the scholar consults books of reference, chronicles, etc., no matter how many mechanical difficulties may be found. Thus the grand seigneur presiding over the Manorial Court felt that the dignity of his position necessitated the use of French rather than English; he, therefore, took great pains to learn the correct words. The clerk, too, called on the villeins and serfs in French, although much effort was needed to learn the necessary formulæ: "Faites vos demandes," etc. When writing a play on Richard Cœur de Lion, a girl, picturing the heroic part of Richard, went through Geoffrey de Vinsauf's Chronicle to find suitable words for Richard to say.¹

¹The resultant drama is distinctly a non-show spectacle, for the present and past are separated by a narrow line to these children. Time and place are almost disregarded, and a chair at one moment may represent France and in the next instant, without any sense of incongruity, it stands for the Cathedral at Canterbury.



PLATE III.

Class V. at work in Craft Room (see Chapter VII.) For the convenience of the camera all the children are grouped at one end of the room. Some are cutting stencils, others helping to make a leaded window, others sewing covers to which the stencil is to be applied, others modelling the Royal Coat of Arms (temp. Edw. III.)

The mere satisfaction of curiosity is not sufficient; "History made interesting" as a rule means the provision of more and more highly spiced meat to satisfy the appetite for the marvellous, till at last in despair the teacher feels that History cannot provide sufficiently interesting matter to meet with the approval of his class. Our History-teaching should be progressive and lead from wonder to work; it thus provides not only material for exciting stories but for life itself. The mediæval monk was a craftsman; then let our scholars try to realise his problems by doing to some extent his work. Then, as now, man solved his problem by work ("You must do the sum to prove it"), and our scholars can imitate the monk's example. The children in Class IV. have thus designed, copied and modelled arches; illuminated manuscripts; tried to write in monkish script with a pen cut from a reed-like stem which they found in the garden. No amount of telling will make the life of the monk so real to the child as doing the actual work of the monk, acting the monk's daily life, writing letters from one monk to another. Consulting chronicles and records for actual details will lead him towards a true experience. The barons in Stephen's time built castles; our scholars try to gain their experience by modelling castles from actual plans and by going out into Birch Fields to find a suitable site on the banks of the stream, or by examining the lie of the land at the school camp at Kettleshulme. The map of England was scanned to find suitable sites, and the boy who settled upon Lancaster as being a likely spot was delighted to be shewn a picture of a castle in this spot. This illustrates what is stated (p. 63 above) as to the inclusion of Geography in this Syllabus.

The children in Class IV. have embroidered tapestries (see an example in Plates 6 and 7); they have by this work come somewhat into touch with the people whose lives they study. Expression is the outward symbol of emotion, and by its means we may awaken in the child somewhat of the spirit which animated its initiation. Imitation is a dominant note of art production; for its object is to arouse a like emotion to that which gave it birth. Thus, by imitation (in its widely differing forms of acting, drawing, modelling, copying, writing) our children are able to approxi-

mate to the spirit of the past and to enrich their lives from the experience of others. To express himself is one of the fundamental desires of man, and thus he makes the things of circumstance mould themselves into lasting monuments of his experience. In short, our method in these "doing" years considers the outward expression of emotion; "What can we *do*?" rather than "What can we *talk* about?" is our fundamental principle in History-teaching.

The children in Class IV. as in Class III. (p. 83) have shown but little desire for exact chronology. Relationship of events proves of great interest, but numbers convey but little. Fifty years ago is as remote as 500 years ago. These children have made a collection of such historical matter—such as pictures, original compositions, designs, illuminations, extracts from chronicles—as their interests and likings suggested. When the question came up of binding documents produced in successive years, a practical reason for chronology emerged, and thus the time chart and dates came to have a more definite purpose. The present is all-absorbing to the child of 10, whether it be his game of cricket or his game of Norman *v.* Saxon, and it is only later that the desire for orderly sequence in centuries and decades plays a leading part in his mental equipment.

The following pages give full notes of a single Section of the History Syllabus, shewing how art, handicraft, reading and composition are associated with the main theme. (The complete scheme for all the Sections for this year, if worked out in detail, and including the correlated pursuits, would by themselves fill a complete volume.)

A TIME OF MISRULE IN ENGLAND.

Main Aim.—How did England fare when the great Conqueror and his sons died?

Sub-section (1) Rival candidates.

" (2) The struggle between the rivals.

Sub-section (3) The agreement.

" (4) The state of England during the struggle.

Sub-section (1).—*Aim.* Who is to succeed on the death of Henry I.?

(a) The lesson was introduced by the teacher reading an extract from the A.S. Chronicle concerning the death of Henry

which begins: "In this year King Henry went over the sea at Lammas; and the second day, as he lay and slept in the ship, the day darkened over all lands, and the sun became, as it were, a three-night-old moon, and the stars about it were mid-day. . . ."

(b) The problem now remained to be stated: Who is to reign? . . . What had happened to Henry's son? As he had no other son, whom might he desire as the heir of his kingdom? (It was noticeable that some considerable time elapsed before his daughter was mentioned as a candidate.) The situation was made clear by one of the class, who remembered a talk at home, and his father's wish that his boys and girls should have benefits in preference to a stranger.

Henry wished his daughter Matilda to become England's ruler. One of the scholars then assumed the part of Henry and discussed methods whereby his wishes might be carried out.

Henry's part now ceased and he was assumed dead. What will happen now?

The scholars now played the part of barons. They met to discuss their reasons for supporting Matilda. The main reason given for their wish to support Matilda was that she was the rightful heir. (It is noticeable that without any sense of incongruity these children immediately settled this problem of "right" by reference to their own family relationships, saying: "It was quite right that Henry should give the Crown to Matilda because she was his daughter, just as in the same way their mother or father would give as much to sister as to brother.") Others gave a second reason: "We promised Henry to help her." A feature of this part of the dialogue was the discussion whether that reason should stand, because Henry was now dead and could not enforce the fulfilment of their promise. It was decided, however, that, having promised, they must fulfil. The third reason adduced was Matilda's ability to pay for their support. So a party to support Matilda was made up. Some of the barons, however, said they did not wish to have Matilda for a ruler because she was a woman.

(c) The question then arose: "What other candidate can we support?" Here the teacher supplied the information which was asked for, and gave a short account of Stephen of Blois and his position, illustrated by a very simple family tree

Will the barons who refuse Matilda favour Stephen? The main reasons for supporting him were then given.

(1) "We prefer a man to fight under." (This reason was clearly the most important, showing that the child's idea of a king is centred round his power to lead the van in battle.)

Here some of the girls objected, saying that a woman could fight, and instanced Boadicea. This objection was overruled, and it was concluded that when it was possible it was better to have a man rather than a woman for fighting purposes.

(2) Some other of the barons thought that Stephen might pay well: "Where would he obtain his money from?" The teacher then told how Stephen appropriated the Royal hoard at Winchester and so put himself in a position to purchase support. Other barons consulting the genealogical table gave their opinion that Stephen has a claim to the Crown, and that, taking all things into consideration, they should support him.

(3) In a previous section (see p. 68) the traders and their towns growing up around castles had been noticed, so the question readily arose: "What side would the tradespeople take?" Some discussion was held on this question, and it was finally settled by one of the girls saying that settled times were necessary for trade. She said that her mother's business was bad because of the coal strike (in progress at the time these lessons were taken). If peace is necessary for the traders, who will be preferred—Stephen or Matilda? Stephen was thought to be stronger than Matilda, and thus by making him king there might be a reasonable proposal of peace. The next lesson consisted in writing letters from Matilda asking the English people to support her. (See Appendix I.)

The following lesson began by a discussion between the adherents of Stephen and Matilda, the scholars throughout assuming various parts as occasion warranted.

Matilda had relatives in Scotland, therefore it is likely they would support her. The King of Scotland sent Matilda word that he would fight for her. Certain of the barons then declared for Matilda and stood forth as representing the adherents from Scotland.

What great and important landowners in England must be consulted? (The scholars are familiar [see p. 68] with the power of the great religious foundations.) On what side will the Churchmen be? Here the teacher's help was needed to point out Stephen's connection with the Church through his brother Henry of Blois.

The adherents of Stephen now stood forth, viz.:—

The Churchmen.

The Traders.

Certain Barons.

The section as dealt with so far was now dramatised from beginning to end at this point, the scholars supplying the parts as the need arose. If we adopted the Herbartian steps, we could label this bit of drama application, a revision of the entire sub-section and an introduction to Sub-section II.

Sub-section II. *The Struggle.*

Aim.—How did the fight between Matilda and Stephen go on?

(a) The lesson began by the scholars taking various parts, viz., Stephen, Matilda, various partisans.

Stephen owned Normandy, Matilda and her husband Anjou. A map was asked for here and the relative position of these countries noted. What would Matilda do? The invasion of Normandy was thought to be Matilda's best move. Normandy was laid waste. "What would you do now, Stephen?" It was decided that Stephen should visit Normandy to try to settle affairs there. It was remembered that he had a large store of money, so that he was able to bribe many of Matilda's soldiers and so make a truce.

(b) As soon as Stephen returned to England he found that a friend of Matilda had been busy during his absence. Who was the friend? David of Scotland (one of the girls) then stood up and called on his men to help him to invade England. The teacher then told the class that one of Stephen's most powerful allies had changed sides and declared himself in favour of Matilda and was busy fighting Stephen in the South of England. David immediately declared himself ready to use this opportunity to invade England. The story of the invasion

was given in narrative by the teacher, reference being made to text-books containing good accounts. The scholars representing the great bishops were asked what they would do to help on Stephen. It was suggested that as they had soldiers they could help to beat off the invading Scotch. The teacher then told the story of the Battle of the Standard. The story was then dramatised. As handwork the scholars made a model of the Standard and drew pictures of the scene.

(c) Many of the bishops and barons had built castles for themselves. Why was this? Here followed a discussion as to the benefits to be obtained in this way. Did Stephen like this? Ought Stephen to make enemies of these bishops and barons? Why was it necessary for him to keep them as his friends? Stephen, however, treated certain barons and bishops shamefully, and they turned to the side of Matilda, who was now made Queen of England.

(d) What happened during the Queenship of Matilda? The class chose one of its members for Matilda, who then considered what her main difficulties were, viz.:—

To hold Stephen and his friends in check.

To keep friends with the people.

To keep friends with the bishops and clergy.

How might Matilda offend the good citizens of London? Many suggestions were made, and the class decided that a "proud" manner would offend the traders. A characteristic question was here asked about Matilda's money resources. The scholars suggested that she might borrow money and so offend her people.

The story of Matilda's flight, the Siege of Oxford, her escape and the reaccession of Stephen were then told by the teacher and afterwards read by the scholars in various books.

Sub-section III. *The Settlement.*

Who is to reign when Stephen dies? It was pointed out that the son of Stephen was dead, and the scholars representing the interests of Matilda and Stephen agreed that Matilda's son ought to rule on the death of Stephen.

The treaty arranging this was drawn up, a text-book being consulted afterwards for the actual terms. (Treaty of Wallingford.)

Sub-section IV. *The State of England during the Struggle.*

Several of the scholars represented large barons. To whom did each of these barons own allegiance? It was clear that, the kingship being so unsettled, each baron became more and more independent. The advantage of building oneself a castle was clearly seen by referring to the small fort which the boys had built in the garden, composed of branches of trees and a piece of sacking. A vivid account of the sufferings in England was read from the A.S. Chronicle. It is noticeable that this sub-section aroused the keenest interest. The class made up a short drama dealing with the baron of a large castle who dragged into his castle all and sundry villeins, smaller barons, serfs, maidens, and compelled them to serve him or pay him money.

The castle and its construction proved of great interest. The Norman castle was already familiar to the class (see p. 68), but now a large model was made as correctly as possible (see Grose's *Military Antiquities*). Picture postcards of Norman castles were hung round the classroom. Wishing to express themselves still further the children designed another tapestry the subject of which was the courtyard of a large castle. (Pictures of castles were favourite subjects for drawing lessons.) The A.S. Chronicle account was much appreciated and gave rise to many manuscript letters purporting to come from cruel barons, from pages in the service of Stephen, and from monks living near large castles. (See p. 97.)

EMILY MATTHIAS.

CHAPTER VII.

ARTS AND CRAFTS: ESSAY AND SYLLABUS.

1. The reformer is always a critic, and since in the syllabus here presented we have to pose as reformer, breaking new ground, we are compelled against our will to expose the failures of our predecessors, for only by sharp comparison of "new" with "old" can the strength of our position be made clear.

In the early days of national schooldom, what was taken to be education was what is now meant by the narrow term "learning." When some lamenting shepherd may confess to some city Touchstone of these days that he has no "larnin'," he may indeed be "damned like an ill-roasted egg all on one side"; at the same time he may be much less one-sided than the smart townsman—in fact, educationally speaking, he is much less "damned." This confusion of education with learning soon exhibited practical results, which opened the eyes not only of educators but also the eyes of parents and employers. Before the era when the child was compelled to go to school he was, in his goings to and fro around his home, continually in touch with action and life—life of a circumscribed character perhaps, but still life, with practical issues which entailed the bending of his whole being to meet the situation at hand. But when he became a scholar he was placed in a restricted space, his activity was practically obliterated, for he had to remain in one position during many hours; his mind was diverted from life and dosed with small portions of specialised information totally severed from the world outside his schoolroom. In other words, at certain times each day the child was, as it were, taken off his feet, laid upon a bed and kept there, physicked with tonics for the strengthening of his muscles, so that after many years of careful preparation he would be able to walk perfectly when he was launched upon his legs. In brief, it was more and more realised that learning did not constitute education, for the scholar was found, after he left school, to be unable to grasp the life-situation with which he was faced. Thus, in spite of all the defences of pedagogic

theory, the employers were largely right when they grumbled about the unpractical character of so-called "education." Some solution for the defect was sought by the introduction of what was known as manual work in schools. This was seemingly an advance, and so it was in a sense, but the school still retained the same un-vital character which it had displayed before.

2. For when manual work was introduced, although obviously it had no traditions of its own to hamper it, it instantly took over all the bad traditions of scholastic method in general. When making out a syllabus of manual work the easiest, most obvious, and incidentally the worst, plan to follow was to treat manual work as a new "subject," allot it a definite time in the time-table, box it up into a definite room, assign each child a definite place in that room, make out a precise course of exercises, carefully drawn up so that no exercise had any obvious relation to life. The "subject" was thus reduced to the same lifeless carrying out of useless exercises which characterised—and still largely characterises—what perhaps may be called the "stock subjects" for a school curriculum, namely, the three R's; the very occupation which had been designed to give that vital contact with things which the usual subjects were unable to afford, itself assumed the same unpractical and un-vital character.

It may be objected that the making of a "joint" in wood-work is practical and vitally useful. It certainly is when that joint is designed and cut as a portion of a usable building or piece of furniture for this use at once determines the type of joint to be employed, and also conditions of measurement and accuracy governing the way in which the workman constructs the joint. But the making of a mere joint, without any relation to its setting in the needs of life, is no more practical nor vital than the working of an abstract arithmetical problem.

Another factor which tended to stultify the craft-work of schools was the problem of providing materials; these were required, above all things, to be cheap and convenient for using under the restricted conditions which the school imposes upon the child. This consideration narrowed down considerably the tools used and the material to be worked upon; so that, when a syllabus was drawn up, it took the form of graduated exercises

in the use of particular tools instead of first proposing real purposes and then selecting tools and materials adequate to their fulfilment.

3. Especially has this domination of materials influenced the development of drawing in schools. When drawing was first introduced into the curriculum, if it were not looked upon merely as a recreation, it was defended as introducing another device for the exercise of judgment or for the pursuit of a definite technical end. The only instrument besides the slate pencil which was cheap enough to be allowed to enter the classroom was the lead pencil; so that the visual representation of externals, which was held to constitute drawing, reduced itself to graduated exercises in the manipulation of a tool—a hard, finely pointed, unsympathetic tool. This produced a line having no more connection with the look of the living things around the child than the figure “2” in the arithmetic lesson has with the two apples concealed in his pocket, for whose sake he is so heartily wishing both arithmetic and drawing lessons at an end. Thus the same devitalising process which has dogged the steps of craft-work has dogged also the steps of art. Granted that the lead pencil has to be used, obviously the easiest way to make out a syllabus (presumably for the visual representation of life) is to take not life, but the lead pencil as the basis. The child commenced at about the age of five to make his unyielding point produce a horizontal straight line. Thence he proceeded to the vertical straight line, and thereafter through the oblique, straight line, the square, the oblong and numerous other meaningless forms until, after about a year’s time, he attained to the dignity of being allowed to draw a curved line. Now, of all things in the world, it is probable that a horizontal line means least to the child. A vertical line can stand for a great number of things and a curved line can satisfy the imagination still further, but a horizontal, straight line to the young child means absolutely nothing and bears no relation to the enchanting externals of life which the child wishes so eagerly to grasp; besides which, as Ruskin has said, “a straight line is one of the most difficult things to draw.”¹

¹ “I do not believe a perfectly trained hand ever can draw a line without some curvative in it. . . . A great draughtsman can, as far as I have observed, draw every line *but* a straight one.”—Ruskin in *Elements of Drawing*.



PLATE IV.

Open Air Class Room constructed by Education Students in their Handicraft Course,
during three weeks at the close of the University Session.

By the time the child reached the top class in the school his drawing lessons consisted almost wholly of an artificial and usually symmetrical conglomeration of curved lines dignified by the name of a "drawing copy." Even at the present time the examination papers for scholarships in some of our higher educational institutions continue to make use of these drawing copies; but they appear to be worse drawn than formerly. It is not strange that children trained in these methods did not become remarkable either for their power of artistic production or appreciation.

When it was found possible to introduce paint brushes and colours into schools almost the same procedure was adopted. The colour was mixed in large quantities by the teacher and dealt out to the scholars. One brush was supplied to each scholar, and then he was directed to make a series of "blobs," which were combined to form some artificial pattern already drawn on the blackboard. Thus, the basis of the syllabus now became not the lead pencil but the "blob."

Some few years ago a real and valuable reform was introduced by permitting scholars to draw direct from nature. In a sense "things" were here made the basis of the syllabus. Although this reform is valuable, it is by no means final; for, both in art and craft work, the true basis for education must be, neither materials employed nor things reproduced, but *LIFE*. The desires and needs of the child in his life at school and at home should determine his real purposes, and to the fulfilment of these he should bend his environment; for only so far as he *realises* the purpose of his art or craft work can such work be of educative value in the training of judgment or in the co-ordinating of mental and physical processes; and the only way for a purpose to be realisable is for it to enter into the life-setting.

4. It is obvious that all the materials required for life cannot be introduced into school; hence, when some pursuit is hampered by difficulty in working the necessary materials, either some makeshift must be invented, or that particular pursuit abandoned. But it will be found that the fundamental and important activities of life can in substantial measure be brought within the capacities of the average school. In making out the following syllabus of art and craft work the basis

adopted has not therefore been any particular material (although in print it is often easier to indicate what is meant by division according to materials used) but the desires and needs which life brings to the scholars at school and at home, so far as we understand them. The syllabus given is not intended to be treated as a series of exercises, but rather as a group of suggestions as to the type of work which will be the natural outcome of life's demands.

Obviously, the real way in which the art and craft work should enter into the pursuits of the school is for the scholars to represent or construct various objects, at the time when these objects are found necessary in the following-out of the schemes for other school occupations (which themselves should be based upon the living interests of the child). Thus, it will be natural, when scholars are pursuing an investigation of the laws of light, for them to turn aside at the required moment to construct their own optical bench or other simple apparatus, and spend perhaps the rest of the day in so doing, instead of having to smother their interest in optics at, say, precisely 10-40 a.m., and give their attention to some beauty of English Literature while their fingers are itching for tools and their minds are straying in the realms of scientific design. From the very nature of modern school organisation and the needs of having *some* time-table it is impossible to carry out the plan here suggested in its entirety, but some approach has been made in planning the time-table of the Fielden School by assigning two consecutive periods for Humanities and Arts and Crafts combined, since much of this art and craft work will be the outcome of the Humanities.

Thus, when the scholars of Class VI. are studying in the Humanities the conditions and results of the invention of movable type for the multiplication of books, correlated handwork will take the form of the making of rough stamps, the cutting of rude diagrams in wood. These form an approach to the understanding and appreciation of the early woodcut process which preceded what we call printing. Thereupon follows the cutting of blocks the same height for printing together. Thus, the scholars gradually establish for themselves the necessary conditions governing the founding of type and the setting-up and printing (with type supplied) of such

FIELDEN DEMONSTRATION SCHOOL

PARENTS' EVENING.

November 27th., 1912.

6.30 p.m. Reception.

7.15 p.m. Concert.

8.15 p.m. Business Meeting in the Kindergarten Room.

CONCERT PROGRAMME

Upper Dep't in Class V Room.

1. Song . . . "The Lark" . . . The School Choir
2. Recitation . . . "Rosabelle" . . . Class V
3. Song "The Bailiff's Daughter of Islington" . . . Choir
4. "Les Trois Souhais" Class VII
5. A Scene from Nicholas Nickleby . . . Class VIII
"Fanny Squeers' Tea Party."
6. Recitation . . . "William's Work" . . . Class IV
7. Songs . . . "O No John!" . . . Choir
Carol "God Rest You Merry Gentlemen"
"Early One Morning."

Primary Dep't in the Kindergarten Room.

1. Country Dances Class III
2. Dramatised Version of "Ulysses" . . . Class II
3. Recitations Class II
4. Country Dance Class II
5. Folk Songs Classes II & III
6. Recitations Class II
7. Country Dances Class III

literary, material as is found necessary by the school or class. This development of printing may occupy the time allotted to Humanities for some two or three weeks, and will afterwards take its place as one of the ways in which the scholar will supply the needs of his school-life.¹

This part of the syllabus has not yet been carried out in its entirety in the Fielden School, but experiments have been made and its possibilities clearly demonstrated. This work has also been taken up as part of the Training Students' Course in Hand-work; and a page of a book, as produced by our scholars, is reproduced on the page facing this. The students printed literature which they required for "Reading and Repetition."

Another example of the way in which the craft-work grows out of the intellectual life of our scholars is given in the suggestion that Class VI. should construct a globe. The scholars have arrived at that period of history when geographical adventure excites interest in the nature of the world's surface. The discovery of the New World makes it necessary for the scholars to have some means of recording the discoveries; these now take place in rapid succession, and for this purpose they require a model of the earth. The planning of the necessary timber structure upon which the spherical surface is to be mounted, the measurement of geometrical curvature in relation to diameters and chords, the setting-out of constructional lines upon that surface for the location of different lands (which lines will afterwards be known as lines of latitude and longitude), all this involves not only the history and geography but the science of that class (which treats mainly of measurement). This globe, when constructed, will, of course, be used in class, and as various portions of the world's surface are studied in future years details of such studies will be registered on the surface.²

5. The development of the occupations during school-life should, roughly speaking, follow the course of development of

¹ For about £10 all the materials necessary for children to become, in an elementary way, acquainted with the limitations and possibilities of type can be purchased, and these will serve for a number of years.

² Where the exigencies of the time-table allow of it, it is an excellent plan for two classes to be engaged upon the same piece of work (for instance, Classes V. and VI. in the past year have together been constructing the globe mentioned above), in which case a scholar of the lower class should be, as it were, apprenticed to a scholar of the upper class.

the fundamental occupations of the race. The Humanities Scheme (see p. 58) traces the sequence of these occupations, which can be broadly divided under four heads, viz., the provision of—(1) Food, (2) Clothing, (3) Shelter, (4) Means of Communication. The craft-work of a school should, therefore, so far as possible, give a practical as well as a theoretical knowledge of man's attempt to satisfy these four needs, and his gradual mastery of more difficult and subtle means discovered in the pursuit of these ends. Thus, in the provision of clothing, the weaving of textile materials and the shaping of them better to fulfil their purposes will commence quite early by the simple interweaving of threads, will progress through embroidery to tapestry and thence to the employment of simple mechanical devices upon which modern textile machinery is based. In the study of shelter the child's craft-work will commence with the fashioning of clay and the weaving of wattles, will progress through the employment of wood, and will trace the tentative growth of gothic architecture; the scholar will fashion his own models so as to involve the real difficulties of the builder, will study classical architecture when the Renaissance brings it into the Humanities Scheme. He should thus finish school, not by becoming an architect or a builder, but by understanding the fundamentals upon which all structures depend, and by understanding also something of the suitability of materials adapted to these various purposes. The development of the means of communication, besides involving development of the spoken, written and printed word, should include the construction of garden-paths, etc., which in turn entail provision for the necessary draining.

6. In the above paragraphs we have concisely explained the general position of art and craft as rational occupations for a child at school. A further word is necessary as to the order of development in successive years. We follow here the same rule that guides us in both humanistic and scientific studies—a rough approximation to progress in the fundamental occupations in the race. We have seen that at all times man is concerned *au fond* with satisfying his three basic needs—food, clothing, shelter; the fourth, means of communication, is especially characteristic of man as a social being. All the art and craft work

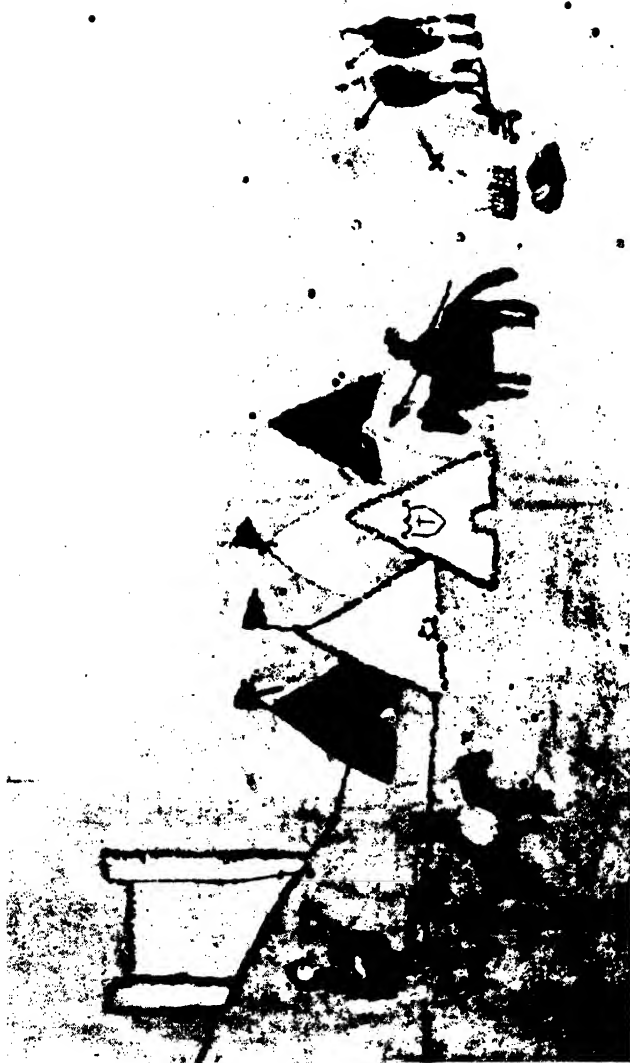


PLATE VI.

Embroidery, after the pattern of Bayeux Tapestry, done by Class IV.
See Appendix I.

proposed in this syllabus can be brought under one or other of these heads, and the syllabus is designed (on its intellectual side) to acquaint the scholar, in his own person, with the story of man's attempt to satisfy these four needs; he learns, not by set lessons, but by a progressive experience, more elaborate and complicated ways of so doing; *e.g.*, in the provision of clothing, of building, as described above.

Now this line of development is complementary to the order suggested in Chap. II. p. 31. From the House, with its domestic circle, to the Garden and Farm on the one hand, and to the Workshop on the other. In each of these the stress of life-experience, with its search for food, clothing, shelter, finds illustration; garden and workshop are extensions of the home, and hence the school building, which contains a living society (or rather a community learning to live), should itself contain and really be a house, a garden and a workshop, where food, clothing, shelter are not merely discussed, but procured. And since the Word and the Book are the crown of all means of communication, the noblest means by which man learns from man, we honour them, not merely with lip service as in our scholastic tradition, but with the hands and brain of the artist and the craftsman. And so, in spite of the scorn which we have thrown in this chapter upon the old education, we teach our children to reverence all that is best in the days of our forefathers, including the books which held them in bondage.

REFERENCES.—1. *General Pedagogy on the Handicrafts*, etc. :—(1) O'Shea, *Dynamic Factor in Education*. (2) Dewey, *The School and the Child*. (3) Ballard, *Handwork as an Educational Medium*. (4) Johnson, *Rural Handicrafts*.

2. Special works to be consulted on the lines of this paper :—Ruskin, *The Nature of Gothic*, being chap. vi., vol. ii., of *Stones of Venice*. (A separate edition of this chapter, with preface by William Morris, can be procured—Geo. Allen, price 1/-.) William Morris, various works dealing with Art and Craft.

SUGGESTIONS FOR SYLLABUS IN ART AND CRAFT WORK.

For Class III. see pp. 85 to 92 above.

CLASS IV.

Drawing (in black and white or colour, as is found necessary or convenient for the purpose in hand).

Picture-diary of the aspects of plants and animals which are studied in the Science Course. Drawings of such elements as are found by the scholars to be necessary for the construction of scenes illustrative of the Humanities (for the illuminating of texts such as charters, chronicles, etc., for the working of models or embroideries, or for the designing of costumes in dramatic work).

Craft-work.—The writing, illuminating and binding of chronicles of historical events (which form the History notebook), the binding of books for other purposes needed by the class.

The modelling of dwellings, castles and churches, in connection with Humanities—enlarged models of architectural details of the period studied, and, if possible, a large model of some famous building (*e.g.*, S. John's Chapel in the Tower of London), in which models the method of building must involve as far as possible the actual builder's limitations and difficulties (*e.g.*, the need for temporary framework in constructing an arch until the keystone is fixed). Such models will necessarily be chiefly in clay, but some of the work at least must be large enough to allow for the modelling of the separate stones in the building. (The general ideas of ratio and proportion will obviously be here involved, and although these ideas should be clearly developed, the strictly mathematical aspect must in no way be forced.)

The modelling of drinking vessels *for actual use* in dramatic work or otherwise—baking and glazing on school premises if possible.

CLASS V.

Drawing (in colour or black and white as found necessary or convenient, with reference to the purpose in hand).

Picture-diary of tree and plant forms, continuing the observations and comparisons instituted in last year's Science Course, if possible with reference to the dates recorded and the weather conditions in relation to growth of plants and trees.

Designs for tapestries, etc. Designs for decoration of MSS. based on tree and plant form. (*Cf.* Mediæval MSS.)

Craft-work.—Writing and illuminating and binding of MSS. in connection with Humanities.

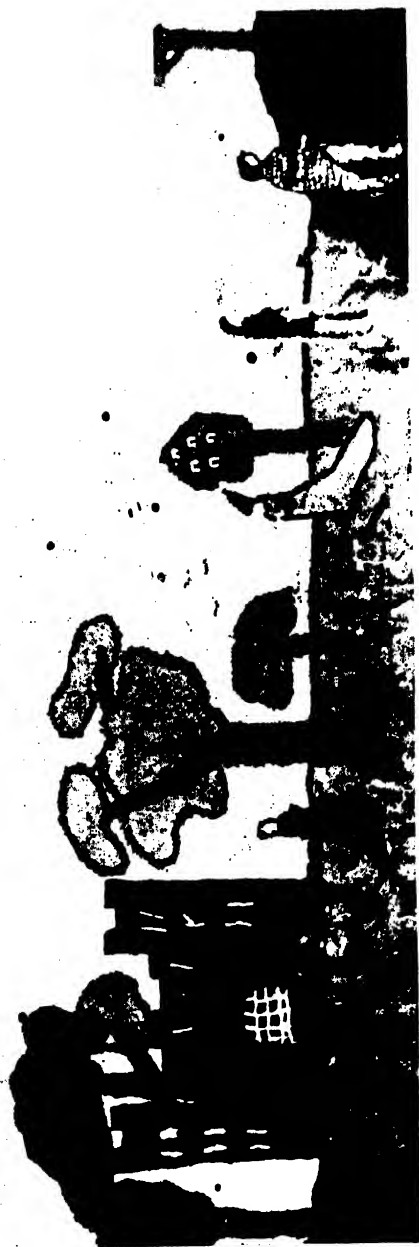


PLATE VII.

Embroidery, after the pattern of Bayeux Tapestry, done by Class IV
See Appendix I.

Weaving of simple tapestries for classroom decoration in connection with Humanities.

Making, painting, etc., of clay vessels.

• Modelling of details of architecture and building, shewing the need behind the characteristic developments of the period studied (such as the use of buttresses, etc.).

Cutting in wood and modelling in clay of the solids used for measurement in the Science Course. (By baking clay models and noting alteration in size and weight, such practical considerations as affect terra-cotta work may be introduced into the Science lessons.)

¹ Designing and making, with the co-operation of Class VI., a large model of the earth with wooden framework and cardboard surface for use in the course of Physical Geography, upon which may be drawn (to the proper scale) the various land portions of the earth as they are discovered in the development of history. The necessary measuring and cutting of patterns of various portions in paper will be definitely related to the Science Course in measurement. This globe should be used by the scholars as they proceed from class to class through school years. (The globe should be about two feet in diameter.)

CLASS VI.

Drawing.—Picture-diary of cloud formation, record of colour of the sky, etc., in preparation for Science Course. Use of natural studies of plant and animal in designs for books, etc.

Designing and cutting of stencils and wood stamps if possible.

Craft-work.—Continue the writing of MSS. The development of printing: cutting of large wooden types, the making and using of a wooden printing press; the setting-up and printing of school notices, etc. (using purchased type); the cutting on wood of rough illustrations and decorations. Book-binding of a more advanced character, with explanation of

¹ The building of the hull of a boat, with rigging, etc., in connection with the Humanities—constructional conditions of large vessels to be involved—in connection with Class VI.

[In the carrying out of large pieces of work such as are here mentioned, if time-table arrangements and classroom space allow, Class V. should work as apprentices to Class VI., as advised on p. 109 above.]

standard sizes of books (refer to quartos and folios of Shakspeare, etc.).

Modelling of country or continent in exaggerated relief for use in Physical Geography. (This should be done, if possible, in large size in garden or field during fine weather.)

Making models of portions of Elizabethan House (*e.g.*, Shakspeare's); also models of the Greek and Roman orders of Architecture, with reference to the Classical Revival, and of some pseudo-classic building of the period (*e.g.*, parts of S. Paul's, London). Models should be constructed *not* of cardboard but in the same way as originals.

Construction of a timber roof as application of the Practical Geometry (example of roof should be taken from some historical building).

Continue tapestries if found of value and interest.

Designing and making of costumes and properties for dramatic work.

See also scheme for Class V. for suggestions of work to be undertaken jointly by the two classes.

CLASS VII.

Drawing.—Realistic drawing of scientific apparatus used and the abstraction of diagrammatic representations suited to the needs of science.

Designing of stage settings for plays studied, and the study from Nature of the necessary elements for such.

Drawing and designing (also modelling) of architectural detail in connection with the revival of Gothic.

Craft-work.—MSS. writing continued, also printing and bookbinding.

Construction of pulleys and other simple machines.

Construction of models of various inventions connected with the Industrial Revolution.

The application of heat to industry in the working of metal. Bent-metal work, hammering, etc.

Modelling of architectural structure relative to the revival of Gothic (*e.g.*, Manchester Assize Courts or Town Hall).

CLASS VIII.

Drawing.—Studies of buildings, involving perspective, preliminary to the scientific establishing of the simple laws of

perspective. Studies in light and shade, reflection and refraction preparatory to Science Course in Light.

Designs for dramatic production, with studies for such.

- Studies of Nature used as basis for evolving the simple laws of composition and design.

Craft-work.—Writing of MSS. and printing continued as found necessary.

Making of electrical and chemical apparatus for school use, *e.g.*, galvanometers, magnetometers, etc.

Properties and dresses for dramatic production designed and carried out.

Continue any line of work of previous years found specially profitable or interesting to individual scholars.

Gardening and Needlework (p. 42).

GENERAL FOR ALL CLASSES.—Apart from the Humanities Syllabus any piece of work about the school within the powers of the scholars should be apportioned to the class best fitted for the work as such work arises. Examples are: Mounting and framing of small pictures, "passe-partout" work, making and repairing of chalk-boxes and waste-paper boxes; decorative friezes for the classrooms; apparatus required for the Science Syllabus; making and binding of covers and writing-books.

For Gardening and Domestic activities, see Chapter II.

JAMES SHELLEY.

PART III.

LANGUAGES AND MUSIC.

CHAPTER VIII.

HANDWRITING: WITH NOTES ON READING AND COMPOSITION.

It is the business of teachers when determining the contents of school pursuits and the methods of teaching them to enquire into the fundamentals which govern these pursuits and not to accept the dictates of fashion as their guide; for fashion is often a mere excrescence upon the natural growth of an art, when, indeed, it is not positively of the nature of a disease. Whenever an art by laborious methods tries to imitate the natural results of some other art (which happens at the time to be nearer to the prevailing fancies of the people), that art may be said to be in an unhealthy condition, for its life is merely parasitic.

When education became generally recognised as of national importance early in the nineteenth century, and handwriting became an important factor in such education, the printed characters of books were unsuited to the work of the pen, the traditions of manuscript writing of the Middle Ages had been practically lost, and teachers, when deciding upon the forms of the written letters, instead of enquiring into the basic principles upon which the art of handwriting should be developed, and attempting to determine the necessary conditions which should govern lettering, took over for imitation the results of another and quite different art which happened at the time to be fashionable, namely, the art of engraving letters upon copper-plate and printing therefrom.

It will be as well to demonstrate clearly that the imitation of copper-plate writing which has for many years dominated school work (either in its true form, or in some broken-down form, such as Civil Service hand) is both inartistic and non-utilitarian. Copper-plate writing (rightly so called) is first engraved with a finely-pointed tool upon polished copper and afterwards impressions are taken from the copper (as upon a visiting-card) by the filling of these lines with ink and then

subjecting, to great pressure the copper-plate with paper upon it. It will be seen from the accompanying figure that the writing upon the copper is necessarily backwards, and that the slant of the strokes is such as to be most conveniently made by the engraver sitting before his copper-plate with the tool in his

printed writing

right hand. A child, sitting squarely in front of a piece of paper, with a pen naturally held in his right hand, will be able to make thick strokes in the same direction as the engravers upon the copper—that is to say, backwards—and cannot possibly make a thick stroke with an ordinary pen with the opposite slant—that is to say, the slant of the proof printed from the copper-plate. However, this difficulty did not open the eyes of the teachers of the period to the necessity of adopting some type of character other than the printed result of copper-plate writing. Having fixed upon the type of lettering needed, the teacher set to work to find what alterations must be made *in the scholar and his materials* in order to produce the artificial result. He found that by twisting the scholar in his seat, making him put his left arm round the top of his paper, and screwing his wrist round until his pen pointed over his shoulder, he was able so to deform the human being as to produce the necessary slope. In order to attain to the fineness of line which is natural to an engraver's tool, smooth-pointed pens (such as a quill) were discarded, and hard and unsympathetic steel pens were substituted, with points so fine as to prevent speed without splutter. In attaining this artificial result, by dint of many hours' copy-book writing each week, the teacher not only helped in the production of curved spines in rapidly growing children, and defective focussing of the eyes by bringing one eye nearer to the work than the other, but also he failed in his purpose of giving his scholars such a foundation in lettering during the school period as should adequately serve their needs when the discipline of school was removed in after-life. It will be shewn later that the admittedly bad writing of Secondary

Schools (where handwriting is not, and should not, usually be taught) and the illegible nature of the handwriting of many adults who were taught to imitate copper-plate writing are due to those very qualities which teachers most sedulously sought for and enforced at the point of the cane during the school years.



After many years' teaching the artificial character of the attempt to imitate copper-plate writing was acknowledged, the copper-plate characters were modified and the systems were produced which we know by the terms "Civil Service hand," "upright" and "roundhand." In bringing about these modifications, the teacher took as his basis an imitation of the results of the process of copper-plate writing, instead of seeking to find the conditions peculiar to the process of writing by hand as an art separate and distinct from the engraver's art.

At the outset the general shape of any lettering we may adopt is necessarily determined by tradition, that is to say, in forming, e.g., the letter "a," we must so shape it that it will be recognised as an "a" by all who are used to reading the customary printed and written lettering of the present day. But these limitations of tradition still leave scope for the modification of details to suit the exigencies of the particular art of writing by hand. Allowing, then, for this traditional determination of general form, what are the fundamental conditions which must determine the detailed form of the letters? How far should these details be enforced upon all scholars? How far should the idiosyncrasies of each child be tolerated? The considerations which must guide us in designing a school alphabet to answer these questions may be reduced to three:—

1. *Distinguishableness.*—The first essential in letters is that they should be as easily distinguished one from the other as possible. This is not exactly what might be understood by the term "legibility." For example, the copper-plate script, in which various letters were made much alike by reducing them to mere up and down strokes with similar joinings, was quite legible when written with the exactness formerly demanded of children copying the exactness of the engraver's tool from which it sprang. But these letters, when they appear in succession in the same word, and are written with the necessary

speed, become highly illegible. To be distinguishable the letters must be based, not upon similar elements, but on diverse elements, which are easily distinguishable.

The old methods of teaching writing, by reducing all letters to common elements (straight strokes and pot-hooks), although producing legible and exact writing during school years, produced just the opposite effect after school years (when the element of speed becomes a governing factor and writing-drill is relaxed) for the very reason which has produced the good writing in school, namely, the reduction of letters to these common elements. In other words, the distinguishableness of letters, if they are to be legible after the removal of school discipline, must depend as far as possible upon the particular differences in the whole construction of the letters, and not upon exact attention to the minutiae of joinings, etc. Any habits in the manipulation of the pen therefore which it is our desire to cultivate should be of such a nature that when these habits become tested under new conditions after school is done with they should retain the elements which make for distinguishableness. When the habit of forming merely up and down strokes (the most dominant habit in the production of copper-plate writing) is slurred after school years, the writing degenerates into mere angular scribble. It cannot be too well recognised that school-writing should not merely consider the legibility and beauty of writing while in school, but should be of such a nature as to retain its legibility and beauty when school years are over.

An example of the way in which the alphabet we have described allows for this principle of distinguishableness may be seen in such a letter as the "h." This letter is formed by the conjunction of an upright stroke with a curve, but adult writing "degenerates," this curve breaks down into mere up and down straight strokes, such as . In order to obviate this the round portion of the letter is made full and finished with a small tick . This tick is only of use because while the habit of making a letter is being formed it makes necessary the full round of the "h," and although later, when speed slurs the habit, this tick will naturally disappear, it will have served its

purpose in helping to retain a distinguishing element in the letter.

2. *Convenience (including speed).*—Whenever an art is stretched beyond the real capabilities of its materials it breaks down, and becomes, humanly speaking, valueless. All arts (even those which are laborious in their methods and serve the exceptional uses of life, much more such an art as handwriting, which must be as little laborious as possible, and serve one of the commonest needs of life) must begin by taking into account the possibilities and limitations of the materials for the carrying-out of the purpose in hand. The materials, used in lettering and the attitude imposed upon the human being while manipulating these materials (all of which are included under the term “convenience”) are of a very restricted nature, and, therefore, must go far to determine the formation of letters when due consideration has been given to traditional shape and to the elements which make for legibility. We must, it seems, take for granted that the materials used are a flat surface, such as that of paper and a pointed tool, such as a pen, which is capable of making comparatively thick and thin strokes. So far there seems no reason why the pen should be of a very fine point (for we have shown this to be the artificial product of an attempt to imitate copper-plate) if the convenience of the writer is better satisfied with a broader pen (such as that of a quill pen or of a “relief” pen). We must take for granted that the most convenient position for the scholar to adopt is either standing or sitting squarely before a desk which has a slight slope, with the writing surface placed squarely before him (such a position as may be seen in old manuscripts of the mediæval illuminators). Under these conditions, with the pen held in the right hand, it is obvious that the natural thicknesses of the writing will be downwards from left to right, thus:



while the strokes made in the direction of copper-plate printing will be thin, thus:



It may be asked, "If the natural thickness is in a back stroke, why should not the writing be sloped backwards?" The answer to this is in concession to another point of convenience, viz., that of speed. If back strokes are adopted it is obvious that the progress will not be as quick as with upright writing, for it is readily seen that upright strokes will naturally be thick ones.

3. *Decorativeness*.—One of the fundamental characteristics of the human being is that, wherever possible, he will fashion his necessities to satisfy his instinct for decoration. This element enters into handwriting, and must be taken into account. Thus letters are made at the same slope and at equal distances apart, because the regular recurrence of strokes of a similar slope is more satisfying to the eye than a disorderly array of differently sloping strokes. A mediæval manuscript is often beautifully decorative apart from whatever sense its writing may convey, because the old black letter was mainly built upon a regular succession of upright strokes. We must, therefore, adopt a lettering which satisfies this decorative instinct in man, but at the same time avoids the possibility of the desire for decoration interfering with the distinguishable character of letters. The old black letter did not avoid this, so that when it was quickly produced (and closely written in order to economise parchment) it became almost illegible, though it was decoratively beautiful.

The following alphabet has been designed to meet the requirements of these three fundamental conditions as far as possible. Capital letters are of late development, and since they are of comparatively rare occurrence, the Roman alphabet has been chosen as fulfilling their requirements:—

abcdefghijklmnopqrstuvwxyz
 1234567890 & ABCDEFGHJKLMNQR

The Fielden Demonstration School

Concerning the Joining of Letters.—One of the points to which teachers in the past have given greatest attention has

been the exact joining of one letter on to another in a word. Old copybooks were ruled with thin lines to indicate exactly where these joinings should be, and if a scholar failed by the hundredth part of an inch to join up his letters he was severely reprimanded and his book scored over with blue lead. In reality, joinings are not parts of letters at all; they often hinder rather than help legibility, and very often adults drop altogether these joinings for the very reason that they were introduced in school, namely, speed. It is a matter of individual idiosyncrasy as to whether joining aids or retards progress of the pen, but it is a fact that wherever joinings are dropped the writing is generally more legible than where joinings are retained. The reason for this is obvious from the foregoing.

The problem now faces us as to whether we shall or shall not enforce joinings in school. It is obvious that the letters should be so constructed that joinings can easily be adopted by any scholar who finds them convenient to himself, *after* the shapes of letters have been thoroughly mastered. It is the business of the teacher to suggest to the scholars the convenience of joining,¹ but it is not a matter upon which one person can dictate to another, and must be left to the scholar's experience to determine whether or not joinings are an advantage to him.

Concerning the Use of Guiding Lines.—As to the use and advisability of employing guiding lines to assist the scholar to maintain the necessary horizontality of the line, there seem to be two extreme points of view. There are, first, those who, in their desire for the delicate and exact formation of letters (such as is attained by copper-plate), would not only provide lines upon which the writing should rest, but also lines to determine the exact height of the bodies of the letters and then lines to indicate the distance up or down, to which the loops of the *l* and *g* should go; some even prescribe intermediary lines to mark the height of the *t* and the exact position of the joinings and crossings of loops, so that in some copybooks as many as four or five faintly ruled lines are used for the making of a letter. On the other hand there are those who claim that the existence of lines hampers the freedom of the young scholar

¹In the Fielden School these suggestions are made first in Classes II. and III.

and becomes a hindrance instead of an aid in forming the habits necessary to the acquirement of ease in writing. Such teachers would therefore use blank paper throughout. We have ourselves adopted a midway course, which we claim possesses the advantages without the disadvantages of either extreme, and secures the desired end, viz., the horizontal *habit*.

When a child, in writing, is required exactly to touch a given line his attention is concentrated, not upon the relation of one letter to another (which is a necessary preliminary to the formation of the habit of horizontality), but upon the exact relation of each letter to the given line. We can see, therefore, and experience proves, that writing upon the line tends only to a small extent to cultivate the horizontal habit. In the case of a child writing without lines the child's mind is riveted to such an extent upon the relation of one portion of a letter to another that he pays little attention to the relation as regards position of one letter to the next; so once more the habit of horizontality is of difficult growth. As the illustration shows (p. 124), we have used lines, but the writing, instead of being *on* the lines, is placed midway between (after the fashion of the mediæval scribes). By this middle course the child has the necessary freedom to be able to concentrate his attention upon the shape of the letters, instead of upon the exact touching of lines. At the same time, the presence of lines at a distance below and above his letters serves the purpose of a reminder (almost sub-conscious) to pay due regard to the size and position of one letter in relation to the others. By this method horizontality may soon be ensured, and since the habit is fixed the lines may then be retained or discarded as the individual preference or need of the scholar may determine.

Concerning the Need for Regular Exercises.—It is maintained by some modern teachers that there is no need definitely to teach handwriting, since children will easily pick it up, and will naturally exhibit their own individuality. If by the teaching of writing is meant the determination to mould all children's writing into one microscopically exact formation, then it were better that writing should not be "taught," for the time needed to do this could be much better spent in other pursuits; but since letters are arbitrary symbols and not natural

ones, we find that some regular drill is needed to maintain the generally accepted shapes of those symbols; and although obviously the individuality is not to be cultivated for its own sake, it is folly not to allow such liberty to the child as will turn any evidences of individuality to their best use. The fundamental outlines of the letters should therefore be kept continually present in the minds of scholars throughout school-life by the adoption of some form of regular exercise, but individual variations of these letters should be allowed in the scholars' writing output as long as the original outline is maintained. The exercises used for this practice in lettering should not be of the meaningless character of the publishers' copy-books; whatever is written should serve some definite purpose in the mind of the child. Thus in Classes III. to VI. (see p. 97) copies of poems for learning by heart are written and illuminated, copies of charters of historical importance form portions of the Humanities syllabus, the writing of school notices form part of the business of the upper classes, and so forth.

Concerning Letter Spacing.—The letters of a word should, comparatively speaking, be close together, but no rule can be given as to the definite amount of space between two letters since no fixed amount will serve; the scholar's eye should be relied upon so to space his letters as to give the general impression of regularity. It is only as regards spacing between words that some rule appears necessary, for the legibility of a page of writing may often be increased by proper regulation; we therefore require that the spaces between words should uniformly be equal to the space occupied by a letter "m."

JAMES SHELLEY.

NOTE BY THE EDITOR.—The reader's attention is invited to the close relation between the standard lettering here adopted and the varied interests fostered in our scholars, from Class IV. onwards, in all matters connected with the Library and the book (see p. 31 and Appendix I.). Mr. Shelley has not selected this lettering solely because it has some traditional precedent behind it in mediæval writing, nevertheless our scholars, who examine early manuscripts, soon perceive that this affair of handwriting symbols has a relationship to early books and manuscripts, to good printing and typewriting, to drawing and decoration. Thus the imagination is stimulated to the production of a distinct effect which may give pleasure to both writer and reader. The scholar perceives that in producing a page, whether a copy or a piece of his own composition, he is a fellow-craftsman in the noblest of all the fine arts. Not being prigs, neither he nor his teachers describe the operation in such terms; but the fact is so nevertheless.

THE BEGINNINGS OF READING.

Learning to Read and Write.—We have no space for the discussion of the processes by which a child acquires his mastery of the written symbols of language. This is the less necessary, because in Huey's *Psychology and Pedagogy of Reading*¹ the student can find abundant material. On the whole the principles described in Chap. XVII. of that book commend themselves to us. Briefly we accept, as regards reading, the simple doctrine of "Look and Say," but the crucial question, which was ignored by the early advocates of "Look and Say," is regarded by us of the first importance, viz., the selection of the words which are chosen for our scholars to look at (and also to write, for reading and writing go together). Their own names come first, then various objects in the room, to which the teacher pins names; thereupon, short sentences describing actions which the scholars do with these objects. Presently a list of the words thus acquired is prepared and copied, and later in the year a reading chart and a diary (all in very large type) are composed. In all this there is no attempt at alphabetical analysis. We made some use a little while ago of a so-called phonic method, but the teachers, especially Miss Gray Maitland and Miss Steel, who have given special attention to this investigation, found it of no practical value. Our conclusion here finds interesting confirmation in a report last year presented to the British Association on "The Mental Processes involved in Learning to Read."² Not that the child mind, any more than the adult mind, shews a distaste for analysis when analysis can be employed to achieve a realisable purpose. As Dumville reports, children later on rely upon analysis so far as they find it needful. With us this need has been observed in the second year in reading, and hence in that year scholars spend a little time in the comparison of syllables and sounds.

The first year of reading is taken in the Transition Class (average age 6½). By that time the little ones have already found how busy their elders are with books and newspapers; they notice names in big letters on shops. If we left them alone the clever ones would start to learn on their own account. We

¹ Compare our *Outlines of Education Courses*, 1911 (p. 128).

² *Proceedings of the British Association, Section L, Dundee, 1912.*

might, if we considered merely the mental powers of children, start their acquaintance with letters considerably earlier. Madame Montessori begins with her precocious Italian children at four; and it is reported to us from Rome that the Mayor (Syndic) of that city is delighted to promote her system because thereby the citizens of Rome will be able to remove their children from school a year or two earlier than at present! The argument commends itself both to ratepayers and employers:—If the elements of learning can be mastered at, say, 10 instead of 12, children can start earning money so much earlier, and the schools will not be so costly. This argument does not appeal to us, or to the parents of our scholars; but the study of "The Montessori Method" (see Appendix II.) makes it clear that we have a good deal yet to learn as regards the child's motor ability. Montessori appears to us to have made valuable contributions as regards the possibility of cultivating the special senses of children, both as regards letters and many other matters. We hope to test her conclusions without attempting in any way to force our children to a mastery of words before the need appears.

In Class I. a very simple book of stories is introduced. Much time is devoted to handwriting, *i.e.*, to the record of incidents which are of interest. These are written on large sheets of rough sugar paper, and a carpenter's pencil is employed before ink is introduced. Thus by Class III. the initial difficulties of both reading and writing are overcome, and these arts are henceforth cultivated, not by the meaningless devices of copy-books and standard "readers," but by constantly reading and recording what the pursuits of the school-day make it needful or interesting to transfer from oral experience to paper. In the same report of the British Association will be found the results of an inquiry by Mr. Frank Smith (formerly a teacher and demonstrator in the Fielden School). His summary of recent investigations, as regards reading after the first difficulties have been mastered, again supports our practice. Our scholars read for meaning, not for reading exercise. When they read aloud their effort is consciously directed to the form and style of expression, as concerned with æsthetic appreciation by the ear. And such oral work is connected with the recitation of poetry

rather than merely reading for reading's sake—for "barking at print," to use Mr. Dumville's phrase.

2. Working on these broad principles (which, as the reader will perceive, are analogous to those which guide us in other branches) we achieve results which visitors of experience tell us are quite up to standard, and the best evidence to ourselves is the commonsense facility with which our young folk in Classes III., IV. and beyond use books as a means of culture (see the Humanities Syllabus in Part I. and the English Literature Syllabus below). But there remains one important question of technique, viz., the selection of a pattern for the letters of the alphabet. We were convinced that some years ago, after a visit from Mr. Johnstone, Professor of the Art of Lettering at South Kensington, that this question had importance as an element in the cultivation of taste as well as regards speed and legibility; and several of the staff, especially Mr. Maltby, came to our aid in helping to solve the problem. It is only recently, however, that we have seen a clear road; and we are indebted to Mr. Shelley not only for the script which we have adopted, but for the essay on Handwriting. The adoption of this syllabus alphabet has met already with striking success; both teachers and scholars are taking it up with pleasure, and the results are gratifying. Careless and untidy writers are being reformed without discipline, and the scholars are finding a delight in the forms of letters, which confirms the doctrine of æsthetics in lettering preached by Mr. Johnstone. It must, however, be borne in mind that in this matter success will also depend upon discipline; everyone who teaches in the school must be prepared to copy the standard form, since repetition and uniformity throughout all classes are essential to success. Those of us who are too old and set in our ways can easily escape from the obligation by abstaining from writing on the blackboard in the presence of our scholars; anyway it is better for scholars to write on the blackboard rather than their teachers.—J. J. F.

A NOTE ON GRAMMAR AND COMPOSITION

There can be no question that Grammar and Analysis can be made of interest to the young by an able teacher, but with "so many worlds, so much to do," the study does not seem to us worth while until some definite point is attained in the Modern Language Syllabus (Class VII. and beyond), where foreign forms of speech require an explanation in terms of language structure. In the same connection, and also in correlation with the Humanities Syllabus (see p. 76), the native vocabulary proves to be worth an investigation—both the names of places and historic families and the common terms of the vocabulary. French and English alike afford specimens for comparison and classification, which are the proper foundation for a scientific interest in philology. Hence in Classes VI. and VII. we add to the period allotted to Language (French and English together) sufficient time for attention to this study. The detailed syllabus will depend upon the needs of the class when concerned with these other branches, and hence it is not prepared separately.

There is one department of language in which we have not yet been able to experiment successfully, but we are seeking further light, viz., Phonetics and Voice Production. This has intimate connection not only with English and foreign languages, but with Singing and Physical Exercises. We discuss the problem briefly in Chapter IV.

From the standpoint of pedagogy, the problem of Composition, oral and written, has much in common with that of Phonetics. In both cases the crucial question is to determine the extent to which the attention of the scholar should be consciously directed to the means by which he produces his effects. Our scholars speak and sing; should they study the mechanism? They compose; should they study the structure of their compositions? In both cases, as in analogous situations which all fields of experience present, we set our faces against such analysis, until we are convinced that the scholar, exercising the art, can realise something of the benefit which such study can confer. We test his state of mind by witnessing in him distinct pleasure derived from the study.

Now, in written composition there are a whole series of technical studies, beginning with handwriting and spelling and taking up in succession punctuation, division into sentences and paragraphs, emphasis, accent, which could claim to come into a syllabus, until we might emulate the elaborate French system (as expounded, *e.g.*, in Hartog's *Writing of English*) and lead our scholars to acquire an interest, for its own sake, in producing an approved style. So far we are agreed at the Fielden School that to devise such a syllabus would not be of advantage in the interests of the literary art itself. Without entering on the controversy, it must suffice to say that in all the classes, as Part I. shews, our scholars copy and compose in a variety of art forms, of which the stock school essay is the least important. The only form in which they have not been practised is that of poetry itself. Many children undoubtedly find pleasure in composing verses; but very few children care to submit their productions to others. We see no way at present by which verse-making can be organised in a class without destroying by discussion and criticism those intimate personal qualities which give distinction to verse. At the same time, it is evident that children do enjoy verse-making when an adequate motive is presented, and in Appendix I. we have offered a few examples.

In prose composition our principle is always the same—to suggest from among the pursuits in which the scholars are engaged some direct purpose which the composition will achieve. This is not easy, for school-life is artificial at best; writing, either for adults or children, is vanity when one is “gravelled for lack of matter.” With the little ones, accompanying their first efforts at writing and reading a diary can be kept; at an older age letter-writing is a good resource. Class III. recently received a present of books for the class library, so a letter to the donor on the best school paper was written by each. (See Appendix I.) An older class has once and again been invited in connection with the geography class work to correspond with school children over the water. (In this direction the Imperial League is rendering useful service.)

Dramatic writing is of exceptional value. To compose “the book,” as intelligible reading, is quite a different affair from

imaging and practising the action and the speech. The language of a scene to be acted affords a variety of expression such as is never presented in the school essay or in mere descriptive writing. An experiment has been made in setting an older class to recall one of the topics studied in the previous year and write a drama on it for the use of their successors. A theme in literature is chosen for the purpose, so that a definite and conscious attempt is demanded to employ in active speech language which otherwise would only be acquired passively.¹

Such an exercise may be undertaken in other literary forms besides the dramatic. The upper classes will make the attempt (on the lines of Belloc's *Eye-Witness*) to reconstruct an historical event in descriptive form.

Finally, as regards the minor matters of composition, the handicraft work which we are now introducing with the typewriter and the hand-printing press will give a motive for attention to spelling and punctuation, which can hardly be secured otherwise. In the ardour of composition a young writer simply cannot attend to both "content" and form at the same time (the specimens in Appendix I. shew this quite clearly). When matter has to be reproduced on a press or a typewriter the attention of the compositor can be fastened on reproducing the correct form.—J. J. F.

¹ Compare Dewey, *How We Think*, chap. xiii.

CHAPTER IX.

„ ENGLISH LITERATURE.

Literature, as usually understood, may be looked upon as a bridge between the Humanities and the Arts, of equal importance to both phases of experience. In its content Literature must of necessity spring from the realm of the Humanities; but, in so far as it is essentially a form of expression, it falls within the domain of the Arts; hence any scheme for the teaching of Literature in schools must take equal account of the "content" and the "form" in its choice of suitable material.

Concerning Content.—Considering first the vast mass of literary material from the point of view of content, we find that little of it is suitable for school purposes. The appreciation of literary, or any other, art depends upon the recognition of the capacity of the symbols used for calling up, or expressing (by direct or indirect association), both thought, feeling and action. It is obvious that unless the thought, feeling and action come within the range of a child's experience, it is impossible for him to recognise the value of any symbols which may be used to express such; if, therefore, a study of such symbols be forced upon him no appreciation can possibly follow, but rather an idea that "good" literature involves unnecessary difficulty and meaningless word-weaving; in other words, a prejudice against Literature will be created. We must, therefore, rigidly exclude from our scheme any Literature, however fine, however important historically or geographically, which does not find some root-hold in the awakened instincts or acquired experience of the scholar. The vast majority of that writing which we dignify with the term "Literature" has its *raison d'être* in some purely adult interest; in fact, the very application of the term is to a large extent determined by the presence of adult interest, for they are "adults" who assign the hall-mark and decide what shall be considered worthy of the term. Puerility in writing is rejected by adults because they have grown out of it, but puerility, by your adult leave, is just what the "puer" wants and ought to have. It is, however, possible to find in the wide field of the Humanities interests nobly and vividly expressed in our

Literature which arise at an early age and persist throughout life, so that they are childish as well as adult in their appeal; and these interests are often found in a work of Literature interwoven with more strictly adult interests. In such a case, we have weighed the importance of the features which can find no response in the child and have decided to exclude or include the work according as those features are essential or otherwise to its artistic unity, from what we conceive to be the child's point of view at the particular stage of development.

Concerning Form.—When we consider the choice of material from the point of view of "form" the amount of historical or other Literature available is limited to an extent which becomes distressing. Just as the content is judged by an adult standard, so are language, construction, style and all that go to make up "form" judged by adult standard. It is, of course, possible by analysis, paraphrase or explanation to make children understand the "meaning" of Literature whose form is far in advance of them; in fact, that is all that is often considered as "teaching" Literature; but the object of including the study of Literature in schools is not so much to help children to understand the subject-matter of great works as to exercise their judgment in appreciation of the author's choice of language and figure for the expression of that subject-matter. The great majority of works in Literature depend for their worth as much upon form as upon content; and if that form cannot be grasped without being paraphrased and explained, how can it be appreciated? In such a case, what is appreciated? If there be any appreciation it is of the teacher's version and not the author's.

Some time back this was illustrated very strikingly in a school very distant from Manchester, where a teacher was "taking a lesson" with Class IV. on the beginning of Gray's *Elegy*. In order to shew the peculiar beauty of the poet's lines, he wrote, with the children's help, a bald paraphrase of the first stanza on the blackboard, and then asked the children which they thought the better version. Without an exception, in a large class, the children chose the paraphrase, to the teacher's great discomfort. But the children were right. The blackboard version expressed in a much clearer and more direct way all that they could understand of the poet's intention; it was,

therefore, better literature to them. The main beauty of such a poem depends, of course, on the awakening of an emotional state which is only possible to much older persons. It is not enough, therefore, that the children *understand* the "wording" for a work to be suitable for schools; it must be within their power to *appraise* the value of that particular "wording" and form generally.

Concerning Correlation with History.—In Part I. we have shewn how greatly our scholars are concerned, in all their Humanities work, with the reading of good books, and many of those brought before their notice in that syllabus are first and foremost works of Literature. Indeed, we are very loth to expend much of our scholars' time on any text-book work (either for Humanities or for Science) which has not the hallmark of good literary workmanship; and for this reason we exclude a good deal of the school-made stuff which publishers place on the school market. But, while thus aiming to cultivate taste by affording good standards, we are by no means satisfied with the provision of literary material merely by way of correlation with History. Here, as in the case of the Art and Craft pursuits, the syllabus provides ample opportunity for correlation; but Literature, like the other fine arts, has a place and purpose of its own. The History Syllabus, therefore, does not assert itself in this volume as a concentration centre; rather it turns to literature, art and craft to help the scholar to a fuller apprehension of the past. The unfolding of History cannot surely afford so complete a compendium of the growing interests and activities of a child as to dominate the realm of Literature, the greatest as well as the most familiar form of expression open to our scholars. If Literature is to be a vital and breathing means of expression to the child it must surely express a wider and more living humanity than any History can give, for History, after all, can never be much more than a kind of "show-case" or picture-gallery in relation to life with subject-matter carefully selected—much as we select pictures for the National Gallery—to illustrate the controlling ideas dominating the various periods; it must always remain a more or less carefully selected "illustration" of life, rather than an actual presentment of the complexity of reality which should form the

To my dear brother in
the name of Christ.
At Whitting abay from
your sister Elizabeth.
G. Weston.

I hope that your A. May
is pursuing as is

Last week I had a
race for getting up late!
to get up to my lesson
long every recreation time
Yesterday a prisoner came to
our monastery and was saved
by us

The read us the story
of B reads virgin at dinner
today

M

My G out. L. W.

be with you

substance of Literature if this is to have anything but a distant and academic significance for the child. And again, although a History scheme, built upon the culture-epoch idea, may manage to sort out and present its material so that it appeals to some of the dominant interests of the growing child, it can by no means find material to correspond to all the child's interests; and, after all, History is the history of adults and of adult activities, however much those activities may be the outcome of instincts which are present in the child. Historical Literature (*i.e.*, both literature written *during* any particular period, and also literature written *about* that period) has, therefore, only been considered in the following scheme so far as it forms part of the expression of human life which comes within the comprehension of the child.

Advanced Literature So-called.—As in other branches of the curriculum the syllabus in Literature is affected by the leaving age of the scholars concerned. In the syllabus here given it is understood that the average scholar will have finished school-life at about 15 years of age. This makes it necessary to introduce into the upper classes as far as possible types of Literature which cannot be fully appreciated until older years, but yet serve to open up avenues for future reading so that the acquaintance with good work may not cease with schooling. We are apt also to underestimate the advance in thought and literary appreciation because the scholars' own efforts at explanation and expression are so halting; hence, if some point of interest *can* be found, it is better to introduce them to heights in Literature which appear beyond them than to let them batten contentedly at the level they have already reached. Shelley's *Prometheus Unbound*, for instance, is suggested for Class VIII., not because the scholars will be able, at the age of 14, to exhaust even a tenth part of its riches, but because it is of an unique character, and also because it stands little chance of being read by them at all if their attention is not definitely called to it. It has sufficient material of interest to appeal to Class VIII. if rightly presented, and in after years its content may be a source of inspiration as well as its form being a source of delight.

Another field of interest which must be anticipated owing to the leaving age is the attempt to develop the power of literary

criticism. Scholars of all ages appreciate the expressive value of words in a broad sense, so that rough and ready judgments are continually being made in the earlier stages as to the relation of the symbol and its intended significance; but interest in considering the niceties of language and the power of dispassionately weighing up form-values in relation to meaning-values belongs usually to a period of life beyond that reached in our school. Some attempt should, however, be made to awaken such an interest in the older scholars as will lead later to the development of the capacity for critical appreciation of the works of others, and of submitting their own written and spoken words to the test of expressive economy.

In both these directions we feel justified in giving opportunity to our scholars. Much is in dispute as to ways and means for training literary appreciation, but our main object is achieved if, by introducing to their notice much that is really good in Literature during these school years, they reach standards and exhibit tastes which will govern their reading in one or other of the many directions here opened out to them. Thus the following scheme is of the nature rather of suggestion than of rigid syllabus. The books selected provide more work for each year than can be properly accomplished; this allows latitude for the personal equation of the teacher since the appreciation of Literature depends much upon this factor; it also allows room for experiment—so necessary in this branch of the curriculum. To be of value the work chosen should respond to the hidden portions of the child-nature, which sometimes well up and surprise scholar and teacher alike. Some of the books chosen may safely be left on one side by teachers who are not themselves attracted by them. *Utopia*, for instance, which is suggested for Class V. to be treated from the historical side, can be most fascinating if dealt with in a sympathetic way by a teacher whose history study begets dreams, but with wrong treatment it can be the most dull and unprofitable book on earth. The same may be said of *Quentin Durward* and Scott's novels in general—they require the right personality to vitalise them.

Method.—The methods adopted in dealing with the material chosen will differ in different classes. Early in the school the poem should arise more spontaneously and casually in the day's

experiences than in the upper classes, where poems will be separately approached and more definitely studied.' In the lower classes, therefore, Poetry books should not be made much use of by the scholars. Poems should be read by the teacher as they naturally seem to fit the circumstances at hand, and if they appeal to the scholars they will be reproduced (by cyclostyle or printing) and kept in cases (which can be made in school) or bound together by the scholars to make their own collection. This plan should be continued through the school for special poems or selections of prose, and as facility in writing becomes greater (Class IV, and above) such work can form the material for the manuscript writing necessary to keep the handwriting up to the mark. (See pp. 97 and 127.)

There is an interest kindled in the scholars by making their own "book," which tends to make more intimate to them the poems which comprise it; besides which it is a difficult matter to get a sufficient number of suitable poems in one book for each particular class.

Literary appreciation begins long before the mechanical part of reading has been well mastered. It is necessary, therefore, for the teacher to read to the class almost all the Literature of the early years; but as the difficulty of reading decreases, books should be gradually introduced in such a manner and with such comment as to cause the scholars to supply for themselves the discrepancy between the variously coloured delivery of the teacher and the monotonous sameness of a printed page. For this purpose there should be plenty of reading by the teacher right through the school. For this purpose also great value is attached to the reading and acting of the plays and the dramatic selections, for by this means the written and spoken word can be kept more intimately in touch with one another, and in the upper classes the comparative study of dramatic with other prose will introduce scholars into the more definite realm of criticism.

One detail of the method should not be overlooked. We are not greatly concerned to "explain" everything to our scholars either as regards the form or content of the text. They are quite ready of themselves to ask for explanation as they need it. If the teacher begins his "lesson" by imitating the method

of the annotated text, or by planning a series of questions on minute points, the class lose interest in the theme and come to regard the text as a "quiz" for discussion and examination, or as a specimen to be dissected instead of an artistic whole. This caution against spoiling a good text by petty interruptions need not prevent the teacher, from seeing that the class, before reading a new poem, are adequately equipped with information necessary to a general understanding of the theme; a masterpiece in any form of art needs to be approached with some anticipation based on apperceptive interest. But the danger of wasting time in talk is great; teachers are prone to "teach" about Literature instead of permitting their scholars freedom to enjoy it; hence we advise that nothing should be said about a poem before it is read, or heard, rather than that teachers with tedious pains prepare "lessons" in Literature, which with the best intentions may shut gates which the poet has unbarred. The only way to appreciate a poem is to hear it read, or to read it for oneself silently and aloud; if it is good enough to learn it by heart—copying, emphasising, cherishing, as we all do, the treasures that artists have placed at our disposal. To ensure that opportunity is given for learning poetry by heart, provision is made in the Time-table and the Home Lesson Diary for repetition at least twice a week as a Home Lesson. (See p. 13.)

SYLLABUS OF POETRY AND PROSE READ IN VARIOUS CLASSES.

The following are only examples of the kind of Literature which is read. Each year an anthology is provided from Class IV. upwards, but the selection of poetry is not confined to the anthology. When required, additional poems are duplicated; both the typewriter and the school press can be requisitioned for this purpose. In Class III. these duplicated poems provide the entire collection and are bound by the scholars in a volume.

As regard prose, many additional books are in the class libraries (see pp. 65, 70, 73, 75, 78, 80).

REFERENCES.—The voluminous list printed by the English Association, *English Literature in Schools: A List of Authors and Works for Successive Stages of Study*, will be found useful by all who wish to introduce children to English Literature. Oxford, University Press, 1912, price 1s. 3d.

CLASS III.: Poems such as the following:—Field, *The Wind*; Wynken, *Blynken and Nod*; Bryant, *Robin of Lincoln*. These and other selections from Chisholm, *The Golden Staircase*; Stevenson, *The Child's Garden of Verses*.

Prose:—Kingsley, *Water Babies*; Ruskin, *King of the Golden River*; Defoe, *Robinson Crusoe*. Collections of Greek and Celtic Myths (continuing the interest aroused in Class II.). Other stories are told by the teacher, e.g., from Kipling, *Jungle Book*, *Puck of Pook's Hill*; Hans Andersen; Grimm.

CLASS IV.: Anthology in use at present, Wimbolt's *Poetry for the Young*. Poetry: Ballads, such as *Robin Hood*, *Sir Patrick Spens*, *Earl Haldan's Daughter*; Morris, *The Man Born to be King*; Browning, *The Pied Piper of Hamelin*; Shakespeare, Portions of *Henry IV. and V.* Prose: Scott, *Ivanhoe*, *Robin Hood* (Told thro' the Ages Series), *Story of Roland* (Told thro' the Ages Series), *Heroes of Asgard*; Malory, *Stories of King Arthur* (pub. by Bell).

CLASS V.: Poetry: Anthology as in Class IV. (selections chiefly from historical ballads; lyrical poems): Tennyson, *The Revenge*; Macaulay, *Armada*; Scott, *Lay of the Last Minstrel*; Browning, *Home Thoughts from Abroad*, *To the Cuckoo*; Tennyson, *Lady of Shalott*. Prose: *At the Beginning of the Year*, Chaucer (Told thro' the Ages Series); Dickens, *Christmas Stories*; Reade, *The Cloister and The Hearth*; Kingsley, *Westward Ho!*; More, *Utopia*.

CLASS VI.: Poetry, Anthology: Browne, *The Poet's Realm or Laureata* (Edward Arnold); selections from Herrick, George Herbert, Shelley, Tennyson, Browning, etc., such as *Blossoms*, *The Gift of God*, *The Cloud*, *The Brook*, *In Memoriam* (parts), *The Merchant of Venice* and *Henry V.* (for correlation with Humanities), *Midsummer Night's Dream*. Narrative: Scott's *Lady of the Lake*. Essays and more elaborate literature can now be commenced. Prose: Scott, *Peveril of the Peak* or other novel of seventeenth century; Bunyan, *Pilgrim's Progress*; Lamb, selections from Essays and Letters; Dickens, *Christmas Carol*.

CLASS VII.: Poetry: Anthology as in Class VI. Narrative: Goldsmith's *Traveller*; Morris, selections from *Earthly Paradise*; Shakespeare, *Macbeth*; comparative study of lyrics by different authors, such as: *Skylark*, Shelley, Wordsworth, Hogg;

Daisy, Wordsworth, Burns, Tennyson; *Daffodils*, Herrick, Wordsworth; Browning, selections from *Pippa Passes*. *Prose*: Biographies: Selections from eighteenth century essayists, Addison, Steele, etc. (Swift's *Gulliver* might be attempted); Dickens, *Tale of Two Cities*; Stevenson, *Across the Plains*, *Kidnapped*; Southey, *Life of Nelson*.

CLASS VIII.: *Poetry*, Anthology: *The Poet's Realm*, or Palgrave's *Golden Treasury* (complete edition). *Poetry*: Shakespeare's *As You Like It*; Milton, *Comus*; Shelley, *Prometheus Unbound* may be attempted. For comparative study poems on Liberty or in relation to modern movements: Hood, *Song of the Shirt*; E. B. Browning, *Cry of the Children*; W. Morris, *The Day is Coming*. Selections from contemporary Poets, Noyes, Watson, Keats, etc., will be read to the class. *Prose*: Carlyle, *Heroes and Hero Worship*. Essays as in Class VII. Ruskin, Selections from *Modern Painters*; Thackeray, *The Virginians*; George Eliot, *Adam Bede*.

C. M. RANKINE BROWN.

JAMES SHELLEY.

CHAPTER X.

THE COURSE IN SINGING.

1. *Relation of Singing to Speech and Physical Exercise.*

The teaching of speech and the teaching of song can be associated in several ways. Training in breathing and in the production of speech-sounds will be valuable as aids to both. The words of well-chosen songs are often suitable for repetition in English literature lessons, and the speaking voice of a child should be made musical. The breathing exercises can be taken for a few moments daily, either as a part of the singing lesson (see par. 9 below), or by the class teacher at other hours of the day; they are not essentially a part of the singing syllabus, although indispensable to produce a good result.

For breathing, and for all exercises in speech and song, children should stand upright in an easy, natural manner. "Attention!" (as at drill) should be avoided, for this generally leads to a stiffening of various muscles, including those of the throat.

2. *Voice Production.*

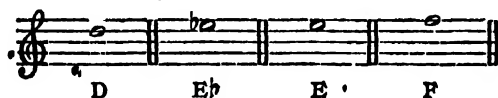
Young children should be encouraged to sing sweetly. Until they are about nine years of age there need be no mention of voice production. If the teaching is good the scholars will sing well long before they know anything of the technique of singing. What is called hearty singing is often not singing at all, but shouting; noise, not music. When the children are about nine years of age they should begin to notice the "break" in the voice.

In the voices of most children there is a change in the character of tone about B, C, D, E or F.



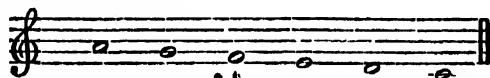
The lower part of the voice is technically termed the chest-register, the higher part of the voice being termed the head-

- register. Children use the chest-register when shouting and often in ordinary speech; in singing the head-register should be used as much as possible. By the age of ten children should find interest in noticing the difference. In order to secure a correct production exercises starting on a high note should be given as D, E \flat , E, or F.



The children would then sing a descending scale or short passage, using the vowel sound *oo* (as in *soon*).

On the low notes such as



care must be taken that the children do not shout.

The task of getting children to appreciate the different qualities of the voice is a difficult one, and the teacher needs to cultivate his own ear carefully as well as to study the registers. Some children sing the whole of the descending scale in the head-register; others change to the chest-register at one sound or another. The head-register should be brought down as far as possible. In such exercises as the following:—



the vowels marked are almost certain to be sung in the chest-register until the change in the voice is mastered. In the early attempts the sounds produced in the head-register are far from loud, but greater resonance is obtained by careful practice.

3. Use of Notation.

Instruction in notation can be begun in Class I., and should thereafter form a regular part of the course. Sol-fa notation is not used, for at best it only serves as a stepping-stone to staff notation.

- (a) Time Notation deals with (1) the shape, name and relative value of notes, (2) accentuation and (3) time-signatures.

The terms *crochet*, *minim*, etc., should be avoided. In their places the terms 1d. note (♩) and 2d. note (♭) etc., may be used; later, one-beat note (♩) and two-beat note (♭). Triplets (♩♩♩) are to be explained when occasion arises. The stems of notes should be turned the proper way.

- (b) Tune Notation deals with (1) the staff, (2) clefs, (3) key-signatures and (4) the proper placing of the notes on the staff in accordance with the scale or key of the composition. Manual signs and descriptive words (*strong-tone*, *calm-tone*, etc.) may be used to enforce the mental effect of sounds.

- (c) Expression marks are to be explained as they occur in the music performed.

4. *Rhythm*. (See note at end of chapter.)

The sense of rhythm will be developed if children are taught to beat the time both with the hands and, in marching songs, with the feet. The simple forms are the two-beat and three-beat rhythms; all school songs can be sung to one of these.

The beating is as follows:—

Two-time ... { ¹Down, ²Up; ¹Down, ²Up.

Three-time .. { ¹Down, ²Right, ³Up; ¹Down, ²Right, ³Up.

(For three-time some conductors beat Down, Left, Up.)

Either (1) the hand only or (2) the forearm may be used in beating time; and as care must be taken to avoid fatigue it would probably be sufficient to beat during one verse only in each song. The beating must be rhythmic, *i.e.*, it must go with a swing. Lifeless movements of the arm are of no use.

DEMONSTRATION SCHOOL RECORD No. II.

Four-time.—Songs in four-time may be sung to the two-beat movement, thus:—

(Beats) { Down 1, Up 2 } Down 1, Up 2

Six-time.—In slow *tempo* the ordinary three-beat movement should be used twice in each bar, as follows:—

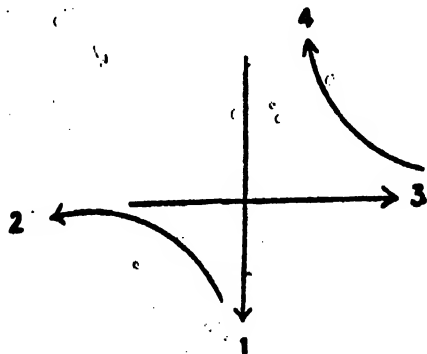
(Beats) 3 | 1 2 3 } 1 2 3 | 1 2 3 } 1 2 3

In quick *tempo* there are two beats in each bar, thus:—

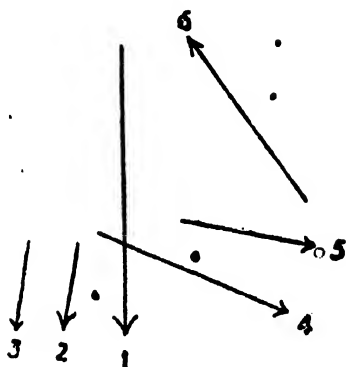
(Beats) { Down 1, Up 2 } 1 2 3 4 5 6 | Down 1, Up 2 1 2 3 4 5 6

At a later period the children should be led to notice the quick 1, 2, 3 to each beat. As soon as convenient the correct beating for four-time and six-time may be introduced. The movements are:—

Four-time,.... { Down, Left, Right, Up.
1 2 3 4
(STRONG, Weak, MEDIUM, Weak.



Six-time ... { ¹STRONG, ²Weak, ³Weak; ⁴MEDIUM, ⁵Weak, ⁶Weak.
 { DOWN, Down, Down; RIGHT, Right, Up.



Some conductors beat:—

{ DOWN, Down Down } LEFT, Right, Up.
 1 2 3 4 5 6

Choice of Music, for Marching and Drill or for Dancing.

It is of the first importance that *good* music should be chosen. Taste is being insensibly formed by what is heard in these exercises. In place of the formal drill which was formerly taught to young children we are teaching them a few of the country dances (so-called) which children, apart from lessons, enjoy as recreation. These are not only delightful in themselves, and valuable as physical training, but directly aid in musical training by cultivating the sense of rhythm. With the older scholars (Classes IV. to VIII.) the time-table has hitherto been too full to afford opportunity for this branch of training.

6. Choice of Songs and Hymns.

Preference should be given, especially with the younger scholars, to simple words and simple music; and care should be taken that the spirit of the song is appreciated. To test this the scholars should be encouraged to ask questions on the subject-matter. The songs provided fall into four groups:—
 (a) National music, from old ballads which are associated with the Humanities syllabus to the standard patriotic songs which are sung everywhere (songs illustrating national feeling at

various stages in our history). (b) Folk songs, such as are now being revived by the efforts of Mr. Cecil Sharp and others. We do not introduce these simply because they are traditional, but the best of them are worth preserving, and the children appreciate their simplicity and directness of appeal. (c) Modern music (including part songs) which is within the grasp of children and is accepted widely as being in good taste. Some of these songs have been expressly composed (both words and music) for children, but we do not lay much stress upon the attempt to write down to the children's level. Much discrimination is required, and work which is feeble and "childish" should be discarded. (d) Hymns. The same rule needs to be enforced as regards the selection of sacred music. Here common usage has sanctioned some sacred songs which are not, musically, of a high standard; there is no reason why in school we should accept the lower standard. At the morning assembly a hymn is usually sung and the endeavour is made to make a choice, both in words and music, which cultivates at the same time the spirit of reverence and the taste for good art.

7. Part-singing.

Unison singing should be the general rule throughout the school, but in the Classes VI. to VIII. Rounds and simple part-songs will occasionally be practised. With few exceptions the voices of children are *treble*. Therefore it would be wrong to set apart certain children always to sing alto; the altos of one day will be the trebles of the next. And on no account should the alto part be too low.

8. Books of Songs

The following are at present used by the scholars:—

The Upper Department.

(1) Nicholson: British Songs for British Boys. (2) Murdoch: School Songs (two parts). (3) Novello's Two-part Songs. For Hymns: Laudate, A Hymn Book for Schools (edition with music). Nursery Rhymes (Book 169).

For Selection by the Teachers.

(1) Various volumes of Action Songs in the Kindergarten. (2) School Songs (Brahms') (Book 16A) (Novello). (3) Classical Songs, Vol. I. (Novello). (4) Classical Songs, Vol. II. (Novello). (5) Cecil Sharp's Folk Songs (Novello). (6) Book of Graduated Rounds (McNaught): Collections of such volumes are kept in the Departmental Library. (7) Harrow School Songs, Gaudeamus and other collections by John Farmer.

9. *General Plan of Lessons.*

- (a) Breathing. As noted above, breathing exercises should be practised every day, either with or apart from a singing lesson, about two minutes.
 - (b) Voice Exercises, about five minutes.
 - (c) Ear-training, about three minutes (the class may be seated).
 - (d) Notation (from Class I. and upwards); about five minutes.
 - 1. For Time (the class may be seated).
 - 2. For Tune.
 (1 and 2 to be alternated: five minutes to Time Notation or Tune Notation in every lesson.)
 - (e) Songs (secular or sacred), about fifteen minutes.
- (Portions of (d) and (e) should be used for exercises in Rhythm.)

Use of the Piano.—Several scholars (in the Upper Department) who have learnt to play the piano are available for accompaniment, but at times the teacher trains the voice without the piano.

10. *Distribution of Classes.*

(1) The two departments assemble separately each morning, and either a hymn or a song is sung by teachers and scholars together. This provides daily practice in singing, but it is not regarded as a singing lesson; if, however, the formal instruction in music is carefully managed, this school singing will afford evidence both in tone, enunciation and expression, of the success attained. Sometimes, too, the children sing in Handwork lessons, and in French and Humanities lessons at times a song is taken by the class teacher. (2) For distinct singing lessons the school is broken up into four groups, each comprising about 40 scholars. (Each group will have two lessons of from half-an-hour to 40 minutes per week.)

Group I. Transition: Class I. (ages 6—8): No instruction is provided in the Kindergarten.

„ II. Classes II., III. (ages 8—10).

„ III. Classes IV., V. (ages 10—12).

„ IV. Classes VI., VII., VIII (ages 12—15).

GROUP I. (AGES 6 TO 8).

Ear-singing.

- (a) Songs and Action Songs (Songs of the Seasons, Nature, Festivals, etc.). With the marching songs there is to be hand-clapping.
- (b) The Major Scale to Sol-fa syllables.

Breathing.

- (a) Breathe in easily for two or three seconds with mouth closed and breathe out with mouth closed.
- (b) Take in breath as at (a) and breathe out through the mouth.

Ear-training.—I.

- (a) Questions as to whether sounds sung by the teacher are high, low, or medium.
- (b) Questions as to whether sounds sung by the teacher are long, short, or medium.
- (c) Questions as to whether sounds sung by the teacher are loud, soft, or medium.

II. In Time. Class to sing with hand-clapping sounds of 1, 2, 3, or 4 beats at teacher's dictation.



III. In Tune. Class to sing from teacher's dictation the Sol-fa steps d, r, m,

- (a) Singly in any order.
- (b) Grouped in any order.

Voice Exercises.—Class to sing d, r, m, or m, r, d,

- (a) To Sol-fa syllables.
- (b) To the vowel sound "oo."
- (c) With consonant prefixed as in coo, too, moo, etc.

Notation.—To be introduced when the ear-training detailed above has been thoroughly grasped.

- (a) Signs for 1, 2, 3 and 4 beats (.
- (b) Meaning of the tie or bind () in comparison with the use of the dot.
- (c) Signs for d, r, m, using one line, then two lines, and placing d on a line or under a line.

GROUP II. (AGES 8 TO 10).

Breathing.—Method as before, with 4, 5, or 6 seconds to each part of the exercise. Vary the position of the children as follows:—

- (a) Hands to sides.
- (b) Hands on hips.
- (c) Hands on lower ribs, with forearm about horizontal. The in-and-out movement of the ribs should be noticed.


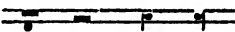
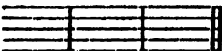
Ear-training.—I. In Time.

- (a) Introduce half-beats.
- (b) Accents, strong and weak.
- (c) Two-time and three-time. (The children must beat time.)

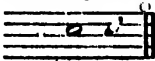
II. In Tune.

- (a) Sol-fa steps *d r m f s*, method as before.
- (b) Later, complete the scale.

Notation.—I. In Time.

- (a) Notes for half-beats 
- (b) Signs for rests 
- (c) Bar-lines 
- (d) Grouping in two and three-time. (The children must beat time as an exercise in rhythmic training.)

II.—In Tune.

- (a) For *d r m f s* use five lines, placing *d* on any line or in any space up to 
- (b) Later, complete the scale.

Voice Exercises.

- (a) Sol-fa syllables *d r m f s*; method as before.
- (b) Change the vowel sounds as follows:—
 - oo to o (low).
 - oo „ ah (calm).
 - oo „ ay (day).
 - oo „ ee (seen).

(c) Prefix a consonant, as in moo-mo-moo. Vary the consonants.

(d) Later, complete the scale.

Ear-singing.—Songs a little more advanced than those given in Group I.


GROUP III. (AGES 10 TO 12).

Breathing.

(a) Exercises as before.

(b) Also practise taking breath quickly through the mouth.

Eqr-training.—In Time.

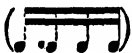
(a) Introduce quarter-beats 

(b) Introduce simple use of rests.

(c) Introduce four-time (chiefly in hymn tunes). (The children must beat time.)

In Tune. Introduce the sharp fourth and flat seventh.

Notation.—In Time.

(a) Introduce $\frac{1}{4}$ beat notes () and rests in various ways.

(b) Grouping in four-time.

(c) Time Signatures. (The children must beat time.)

In Tune.

(a) Letter names A, B, C, D, E, F, G.

(b) The G clef.

(c) Uses of \sharp \flat \natural .

(d) Key signatures of major scales not exceeding three sharps or flats.

(e) Diagram of the pianoforte keyboard.

Voice Exercises.

(a) Combined vowel sounds, viz., oo-o-ah-ay-ee or ee-ay-ah-o-oo; and in varied order.

(b) Simple exercises in two parts for control and pitch, and as preparation for two-part singing.

Example:—



School Songs.

- (a) Songs.
- (b) Rounds.
- (c) Hymns and Christmas Carols (some to be learnt from Notation).
- (d) Simple two-part songs.

GROUP IV.

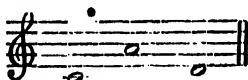
Breathing.—For further exercises the teacher should refer to Hulbert's Primer on Breathing (No. 63, Novello).

Ear-training.—In Time.

- (a) More advanced use of rest.
- (b) Introduce $\frac{3}{4}$ time. (The children must beat time.)

In Tune.

- (a) Additional chromatic sounds, as *lah-se-lah*.
- (b) With increasing attention to leaps, as in the following:



- (c) Exercises on the Melodic Minor Scale.
- (d) Dictation exercise in two parts. (For these the class will be divided into two groups. One group will be told to sing *fah* and the other *lah*, etc.)

Notation.—In Time.

- (a) $\frac{3}{4}$ time. (The children must beat time.)
- (b) Other time-signatures to be explained as they occur in songs.

In Tune.

- (a) Some reference to the F clef.
- (b) Key-signatures to five sharps and five flats.
- (c) Simple changes of key.
- (d) Melodic Minor Scales.

Voice Exercises.

- (a) Gradual increase of range.
- (b) Greater attention to purity and volume of tone.
- (c) Simple *arpeggio* exercises.

School Songs.

- (a) Songs from the simpler works of the standard composers.
- (b) Two-part songs.

T. KEIGHLEY.

REFERENCE.—With reference to rhythm, I can now (February, 1913) refer to a work on rhythm and music to be shortly published. In preparing this work I have been able to conduct a class of children at the Fielden School and classes of adults at the Royal Manchester College of Music, testing some of the principles expounded by Jaques Dalcroze in his "Eurhythmic System."—T. K.

CHAPTER XI.

MODERN LANGUAGES.

1. We present in this chapter a syllabus of five years' study, commencing at the age of ten—a four years' course in French only, followed by a year in German only. Such a plan raises the following questions, which we may answer concisely:—

(a) What is our purpose in introducing a foreign language among the school pursuits?

(b) Why do we delay the study until the age of ten?

(c) Why do we take the two languages in succession instead of side by side?

(d) Why do we devote four years to the first language and only one to the second?

(e) Why not transpose the order of the two languages?

(a) Our purpose is not only (or mainly) to prepare our scholars for commercial or industrial pursuits, but to lay the foundation for interests and sympathies which are part and parcel of the modern world. Berlin and Paris are nearer to our Manchester children now than London and Bristol were a century ago. The literature, history and social life of these peoples are indispensable as elements in social progress. We do not make excessive claim for the influence of the school as affecting the sympathies of a new generation, but it may be safely asserted that better relations with continental neighbours are definitely affected by what takes place in school. Thus there is real ground for the belief that the sympathy in English adult society towards France (*entente cordiale*) in our day is partly due to the learning of French, however imperfectly, by many thousands of English boys and girls of the past generation. And, conversely, the comparative neglect of German in schools has made *Annäherungsbestrebungen* between England and Germany more difficult to realise.

(b) We commence about the age of ten because up to that time the scholar's intellectual range is too restricted to enable him to appreciate the need of reaching beyond his

own country.¹ We do not delay longer because the difficulty of adapting the powers of expression to a new language increases with every year of delay. The *resistance* offered by the native tongue is one chief hindrance to progress; the new habit can best be established if the effort is undertaken in early years.

(c) This is the reason also why we only take one language at a time, instead of following the practice of so many secondary schools, of pursuing two languages concurrently. An intensive pursuit of the first foreign tongue for at least three years seems to us to be required in order to establish it in familiar use.

(d) For the same reason we persist with the one language until it is well "established" as a medium of expression. After three years the habit, at once physiological and mental, of dropping the vernacular has become easy. Then the scholar can safely be permitted to superimpose a second foreign language, the first being for the time dropped. We have found that in one year's study of the second language the scholar makes as much progress as in the two years when he began the course and was confronted with the initial resistance. Further, the lines of the teaching are already familiar—the personal questions, classroom phrases, method of handling a text, have all been practised before, and the scholar now become more mature, generalises his new knowledge and quickly makes himself at home, very much as a boy does who begins Greek at 16 after having got a good hold of Latin before sixteen.

(e) When we opened the Fielden School in 1905 we chose German as the first language; for Germany has special relations, both commercial and social, with Manchester. Here, if anywhere, the rising generation should learn to appreciate a country which is so closely connected with their native town. This class followed the plan of three years German, followed by a year of French, in which German was dropped. The results were so gratifying, especially as to the progress in the French year, as to justify our confidence in the psychology of (c) and (d).

¹ For a fuller discussion on this point see *P.C.T.*, pp. 196-98.

above. But in later years we had to reverse the order. The lack of teachers and students familiar with colloquial German defeated our intentions. The difficulty works in a vicious circle; so little German is cultivated in the secondary schools, hence few students pursue it in the University; the result is that few students who witness our demonstration lessons can follow a German lesson, and fewer still are available as staff teachers in the school. There are at present signs of greater interest in German, both in the schools and the Universities; we look forward therefore to offering a beginning in German to every scholar before he leaves us, although we can scarcely hope to revert to the ideal plan which would distribute the five years when the first three given to German, followed by two of French.

2. It is not necessary here to set forth the fundamental problems involved in the teaching of modern languages, according to the "Direct Method." The theory of the subject can be studied in one or other of the following:—

Jespersen: *How to Teach a Foreign Language*. (This book is indispensable for the study of the subject.)

Kirkman: *The Teaching of Foreign Languages*. (Comprehensive, and full of valuable suggestions.)

Breul: *The Teaching of Modern Foreign Languages*. (The bibliography is most valuable.)

Schweitzer: *Méthodologie des Langues Vivantes*. (Paris, Armand Colin, 1903.)

Max Walter: *Zur Methodik des Neusprachlichen Unterrichts* (1908), and *Aneignung und Verarbeitung*. (Wortschatzes (1907).)

(Both published by the Elwert'sche Buchhandlung, Marburg.)

Von Glehn: Three articles on the Teaching of French in the *Journal of the Assistant Masters' Association* for Oct. and Dec., 1909, and May, 1910.

Findlay: *Principles of Class Teaching*, Chapters XIV. and XV. (Treats the fundamental questions of method in acquiring a modern language.) See also *Transactions of British Association*, York meeting, 1906.

Eggert: *Der Psychologische Zusammenhang in der Didaktik des Neusprachlichen Unterrichts*. (Berlin, Reuther und Reichard, 1904.) (A full treatment of the psychological processes involved in the teaching of modern languages.)

O'Shea: *Linguistic Development in Education*. (Discusses the whole problem of language acquirement, native and foreign.)

Stockton: *The First Year's Course in French*, in *D.S.R.*, No. 1.

Official Memoranda on the Teaching of Modern Languages:

(c) *Scotch Education Department*, Cd. 3,546.

(b) *English Board of Education*, Circular 797.

Report of the Joint Committee on Grammatical Terminology. (John Murray, 1912.)

The following are examples from a large number of books published in recent years following more or less the principles of the "Direct Method." Our scholars do not use any of them in the Fielden School (see below), but we recommend students to consult them, since they contain many valuable hints on method or in the selection of subject-matter:—

Thouaille: *First Steps in Colloquial French*. Florian: *First Book of German Oral Teaching*. Longmans' *English Course for Indian Schools*. Wichmann: *Am Rhein*. Walter and Krause: *Beginners' German*. Müller and Wenckebach: *Glück Auf*. (Other elementary texts by Wenckebach are also valuable.)

Since the reform movement which began in the '80's a large number of books, pamphlets and magazines dealing with various phases of the subject have been published to further improved methods of modern language teaching. The German books mentioned are of value even to those who do not read German, for they contain many examples of reading material in French and methods which the authors have found useful in working through them in a classroom. Max Walter's works are full of such valuable illustrative material.

SYLLABUS OF THE 'FOUR YEARS' COURSE IN FRENCH.

Time Allotment.—The following syllabus is planned for four years, commencing with Class IV. In the first two years

five periods per week are allotted; in the third four periods, and in the fourth three periods.

The standard which good scholars should attain ought to be equal to that of a Senior Leaving Certificate in conversational use of the language and in reading and free composition, but not so advanced in grammar, since the scholars are too young to admit of any advanced study of syntax or accidence.

Correlation.—While modern language teaching is treated as an independent branch of study, some attention is paid in Class VI. to English Grammar (see p. 131), and this will aid the study of language forms in French. We also consider correlation as regards the choice of material. Preference is given, particularly in Classes V. and VII., to topics which are related to the Humanities syllabus. As regards correlation in Grammatical terminology, we welcome and follow the report mentioned above.

Text-Books.—No text-book is used in Class IV.

Class V.—Burle: *L'Histoire Nationale Racontée aux Enfants*. (Paris, Alcide Picard, 75c.)

Class VI.¹—*La Petite Blanche Neige et autres Contes de Fées*. Hartog: *Grammaire Française Pratique*.

Hart and Hardress O'Grady: *Writing of Free French Composition*.

Class VII.—Selection from Blackie's *Little French Classics*. 6d. each.

Les Cents Meilleurs Poèmes de La Langue Française. 6d.

Larousse: *Nouveau Dictionnaire Illustré*. (Librairie Larousse, Paris.) 3 francs.

3. *Notes on Method.*—*Use of a Text-book in French Grammar*. During the third year Hartog's *Grammaire*

¹ The difficulty at this stage of finding any text of sufficient simplicity of language which has any useful relation to French "Kulturgeschichte" compels us to choose a little book solely from the standpoint of simplicity of construction and purity of style. This series (Stead's *Books for the Bairns*, in French) has the advantage of being illustrated and of being encumbered neither with vocabulary, notes, nor questionnaire. [Since this was written an excellent book has been found, and will be used next session for Classes V. and VI.—*Lavissee. Récits et Entretiens familiers sur l'Histoire de France*. (Paris: Armand Colin; 60c.)]

Française, Pratique, Part I. (Fourth Edition) is introduced. The main purpose in using this book will be to help the scholars to systematise their knowledge of French accidence, particularly of verb forms. The scholars in Class VII. will also find Part II. of some use in syntax, but on this side of the work all elementary French grammars are unfortunately deficient. It should be noted that as soon as the scholars hear or speak of verbs or other grammar forms they use the French terminology, and do *not* revert to English speech. (For the terminology adopted see "Report of the Joint Committee.") Thus this part of the instruction, equally with the rest, gives practice to the ear and voice in the use of the French language. This rule should be rigidly adhered to, since advanced points of grammar are out of place with scholars under fifteen. If, however, the teacher occasionally thinks an explanation in English of a topic such as the subjunctive would be really helpful, we make no pedantic rule to forbid the vernacular.

Pronunciation and Phonetics.—We regard the acquirement of right habits of pronunciation as so largely a matter of imitation and practice that we do not introduce a phonetic script to aid the ear. But when the scholars approach a stage at which they are left to read by themselves, they feel the need for a classification of sounds corresponding to the printed symbols. Hence in Class VI. a portion of the time is spent in collecting a series of words and syllables identical in sound, and these are analysed in groups. While thus abstaining from making phonetics, as commonly understood, a feature of the elementary work, we attach all the more importance to the teacher's acquaintance with the physical basis of the production of sounds. And we recognise that the beginner needs to concentrate his attention on hearing and on correct reproduction, especially in French, where the obstacles are greater than in German.

Use of the Gramophone or Phonograph.—We introduced a phonograph some six years ago in the First Year Class, and found it useful (see *D.S.R.*, No. 1, p. 65) for the learning of French songs. These talking machines are likely, however, to be of more service in advanced classes, serving a similar pur-

pose as that achieved by hearing a French play (see below). We shall make use of Records produced by Pathé Frères, containing fables from La Fontaine, poems by Victor Hugo, etc.

Work Outside of the Classroom.—(a) *Home Lessons.*: No home lesson is arranged until the end of the first year, since work attempted apart from the teacher tends at this stage to spoil pronunciation. Thereafter at least one home lesson is arranged for every week. In the more advanced work the scholar can naturally do a great deal by himself. The exercises take the form of writing answers in French to simple questions on passages read in class, and, later on, giving a more connected account in their own words of an incident based on the text. During the second year and afterwards, grammar exercises, such as the different tenses of verbs, can be practised, as home work.

(b) *Attendance at a French Play and Foreign Travel.*—Occasionally a company from France visit Manchester and once or twice opportunity has been taken of such a visit. Classes VII. and VIII. read the play beforehand, attend the performance, and continue the reading afterwards. Even if much which is heard from the stage is not well understood, the general effect is beneficial. But we attach much more importance to a visit to France, which our teachers have occasionally arranged for a few scholars whose parents can afford the outlay during a summer vacation. Each scholar is placed by himself in a foreign family, on plans which are now familiar to many modern language teachers. The special value to the school is that the experience of the few who have enjoyed the holiday abroad reacts most favourably on the entire class when they return.

4. *Summary of the ground covered in each year.* (See table on next page.)

N.B.—It is noted elsewhere that the progress of a syllabus extending over several years necessarily depends upon the quality in each year of both teacher and taught; but whereas in Mathematics the new topics assigned to a year cannot be taken up if the previous year's study has not been grasped, in Science and Humanities the same rule is not required. In a Modern Language the variations in progress are likely to be even greater than in those pursuits. We do not, however, as regards choice of text-books, depart from the plans proposed for each year, but if a class in any year after the First is backward, more time must be taken for pronunciation and other elementary work, instead of attempting to cover so much of the new ground.

FIRST YEAR.—(CLASS IV.)

PRONUNCIATION.

All the difficulties are encountered, and, therefore, attacked this year. Attainment of a good pronunciation is one of the objects in this first year.

MATERIAL.

- (a) Classroom phrases.
- (b) Personal topics, with a few everyday phrases.
- (c) Outline of Geography of France.
- (d) A dramatic version of some simple short story.
- (e) Songs and action songs.

SECOND YEAR.—(CLASS V.)

Continuation of (a) and (b), as in First Year. Incidents of French history with text-book.

THIRD YEAR.—(CLASS VI.)

Classification of Material taken from the Reader and the Book of Short Passages. (Hardress O'Grady.)

FOURTH YEAR.—(CLASS VII.)

Rapid reading of short classics.
Poems.

GRAMMAR.

Présent of a large number of verbs is used in sentences, but it is not learnt formally as a paradigm. (*Menu des trois personnes.*)

Futur and *Parfait*, *Pluriel des noms et des adjectifs*, *Place des pronoms personnels*, etc.

Imparfait, *Passé Historique*, *Futur dans le Passé*. *Voix passive*, etc.

The systematic study of some important points of syntax is begun, including the use of the *subjonctif*.

COMPOSITION.

Beginnings of oral composition in connection with Material.

Oral Composition connected with Reader. Some written compositions attempted on the same topics.

Oral and written Composition in connection with books and poems read.

NOTES ON THE SUCCESSIVE YEARS.

Syllabus for the First Year.—For a detailed syllabus of this year the reader is referred to *D.S.R.*, No. 1, pp. 59-68. With a few unimportant alterations the scheme laid down there is followed. A few of the phrases are not good French, and have been revised.

Material.—In addition to the material specified (pages 60-63) use is made of a series of maps of France,¹ published by Armand Colin, Paris (3-50f. each). The maps are large enough for the scholars to follow from their seats. The blank map is first taken. When the danger of substituting English sound values for French is past, the map containing the names of towns, etc., can be shewn. The special importance attached to pronunciation in this year is emphasised above.

Vocabulary.—The acquirement of vocabulary in this year is quite subordinate to the cultivation of a good pronunciation, but the number of words learnt during the year reaches some 250. (See p. 66, *D.S.R.*, No. 1.)

Syllabus for the Second Year (Class V.).—*Material.* The scholars can now express themselves in French on a few topics suggested by their own immediate environment—they will have talked about the geography of France and have learnt to sing some simple songs and tell one or two simple stories; they will have indirectly learnt the present tense of a number of verbs, and are now ready to extend their use of the language to topics other than that suggested by the classroom and the immediate environment.

Now arises the question—On what lines shall the scholars' vocabulary be extended and how shall they acquire that vocabulary?² Hitherto there has been no difficulty. The scholars have done things and told what they were doing in French, or they have seen and touched things and described them. Naturally such a method of approach can only have a limited application.

¹ The same firm also issues similar maps of Germany and Spain. The names of seas, towns, etc., are in German and Spanish respectively; hence their value in the teaching of modern languages.

² For a valuable discussion of this point see Walter—*Aneignung und Verarbeitung des Wortschatzes*.

Care should be taken throughout the course that the vocabulary which the scholars acquire shall be of such a general character as will be most useful in reading ordinary French books and in carrying on intercourse with French people, if any of our scholars have the good fortune to visit our neighbours.

A series of pictures is often made the basis of an elementary French course. Some of these pictures are very unsuitable, because the scholars acquire from the study of them a too specialised vocabulary. Our scholars do not need to know the French terms for all the articles in a dining-room or kitchen, for the various materials and tools used in building a house and for all the parts thereof from roof to basement. Even the popular series of the "Four Seasons" is not quite free from this taint, and there is nothing more monotonous than the study of each of these four pictures, one after the other, if they form the sole basis for an elementary French course.

We cannot, however, get on without pictures; they are an invaluable means of acquiring vocabulary, but the pictures must be so chosen that a really useful vocabulary is acquired by our scholars. An *illustrated* elementary French history forms the basis of much of the work throughout the year. The text, however, is not read by the class; they merely study the pictures illustrative of well-known incidents. Preference is given to those which have some bearing on the Humanities course. (See p. 70.)

Method of Treating the Material.—The pictures are treated somewhat as below:—

First Picture.—*Le Couronnement de Charlemagne.* The scholars find the page and begin to study the picture and describe what they see.

T.: *Que voyez-vous sur le tableau?* S.: *Je vois un homme.*
 T.: *Que voyez-vous Charles?* S.: *Je vois un autre homme.*
 T.: *Et vous, Robert, que voyez-vous?* S.: *Je vois sept hommes.*
 T.: *Que fait cet homme-là?* *Il est à genoux.* (This will have to be told the class; to further impress the word and its meaning the teacher will give the command "*à genoux*" to several scholars.)

Teacher: *Cet homme, qui est à genoux, s'appelle Charlemagne. Comment s'appelle-t-il, Jean? and so on.*

This will go on until the whole situation illustrated is clear to the class. After treating the material orally, the scholars will be able to set down the following account in their French books:—

Le Couronnement de Charlemagne.

Charlemagne est un grand roi, il demeure à Aix-la-Chapelle. Il est à Rome, dans la Cathédrale de Saint-Pierre. Rome est une grande ville d'Italie; Rome est la capitale de l'Italie. Charlemagne est à genoux devant le Pape. Le Pape lui met une couronne sur la tête. Le Pape le fait empereur. Derrière le Pape se trouve un moine et à sa droite un évêque. Il y a aussi un grand nombre de soldats dans la cathédrale.

This material forms the basis for a "Questionnaire." *Qu'est-ce que Charlemagne? Où demeure-t-il? Où est-il sur le tableau? Où est Rome? Quelle est la capitale de l'Italie? Nommez la capitale de la France . . . etc.*

The scholars should have practice in asking questions, after these have been put a number of times by the teacher. The picture of Charlemagne visiting his school might next be taken and then "*Roland à Ronçevaux.*"

The following pictures can also be taken:—

Départ pour la Croisade.

Prise de Jérusalem par les Croisés.

Le Siège de Calais.

Le roi Jean et son fils à Poitiers.

Jeanne d'Arc (a series of pictures).

For the last topic, which will come towards the end of the year, the teacher prepares a simple account in French of the Maid's life, and has it typewritten and duplicated. Each member of the class has a copy and keeps it in a special portfolio. (This can be made by the class during the hours devoted to Handwork.) The class will be ready to approach the story in this new way. The account is written in the present tense as far as possible, since the transition to the complexity of verb forms must be gradual. Any difficulties in vocabulary are explained by the teacher, either in French words, by suggestion,

by drawing, by pictures or by action. Many incidents can be dramatised, and with beginners this is an excellent plan to follow. Children delight in playing parts, and this gives variety and life to the teaching. The following is an example of such dramatisation:—

JEANNE D'ARC A CHINON.

Personnages.—JEANNE D'ARC.

LE DAUPHIN.

COMTE DE VENDÔME.

DES SEIGNEURS.

(Le Dauphin est entouré de ses seigneurs.)

Le Comte de Vendôme entre.

LE COMTE: Monseigneur, la jeune paysanne est arrivée.

LE DAUPHIN: Faites-la entrer.

Le Comte de Vendôme sort.

UN SEIGNEUR: Qui est cette paysanne?

UN AUTRE: C'est une jeune fille, qui dit que Dieu l'a envoyée au roi.

LE DAUPHIN (descendant de son trône): Je vais me mettre parmi vous et nous verrons si elle me reconnaîtra. *(Les seigneurs l'entourent.)*

Le Comte de Vendôme entre avec Jeanne d'Arc. Elle va droit au dauphin, ôte son chaperon et fait la révérence à la paysanne.

JÉANNE: Dieu vous garde, gentil dauphin.

DAUPHIN: Comment vous appelez-vous?

JEANNE: Je m'appelle Jeanne la Pucelle.

DAUPHIN: Pourquoi êtes-vous venue ici?

JEANNE: Je suis venue vous dire que vous serez sacré roi de France à Reims.

DAUPHIN: Qui vous a dit cela?

JEANNE: C'est le bon Dieu. Trois fois j'ai entendu une voix qui disait "Allez trouver le dauphin et dites-lui qu'il sera couronné roi de France."

DAUPHIN: Et que voulez-vous?

JEANNE: Donnez-moi une armée et je chasserai les Anglais d'Orléans.

DAUPHIN: *Que savez-vous de la guerre, vous, une paysanne?*

(Les seigneurs éclatent de rire.)

JEANNE: *Rien, mais Dieu m'a envoyé pour sauver la France.*

(Les seigneurs continuent à rire.)

DAUPHIN: *Nous en reparlerons une autre fois. Vendôme, emmenez la jeune fille et logez-la dans la tour. Au revoir, mon enfant.*

JEANNE *(faisant une révérence)*: *Dieu vous garde.*

(Elle sort avec le Comte de Vendôme.)

Vocabulary.—They learn poems and sing songs as in the First Year. Opportunity is taken for introducing everyday phrases—weather, festivals, holidays, etc., etc. The vocabulary should be extended in every possible useful direction, but always slowly and carefully. The scholars should have enough opportunity for repetition of things learnt, new words and phrases being thoroughly practised. As in the First Year, the teacher keeps a diary of all the new words learnt.

Grammar.—The scholars in the First Year learned the present tense of certain verbs, by doing certain actions—*je me lève; je ferme la porte*, etc. They now learn to use the tenses required to describe an action which was done yesterday—*j'ai fermé la porte hier*; similarly for an action to be done to-morrow—*Je fermerai la porte demain*. A useful exercise is an account of the scholar's day—*Je me lève à sept heures, je prends le petit déjeuner à sept heures et demie, je quitte la maison à huit heures et quart*. . . . Such expressions form a basis for exercises in the past and future tenses of the verb; e.g., a scholar can relate what he did yesterday or proposes to do to-morrow.

The plural forms of nouns and adjectives should receive attention, always by use of a different number of objects:—*Georges a deux plumes. Combien de plumes avez-vous, Charles?* Gradually pronouns should be substituted for the substantives employed, e.g., instead of *Donnez-moi votre cahier*—*Donnez-le-moi*, etc.

Home Work. At the end of each lesson any new sentences that have been learnt are entered in the *cahier* and questions are

dictated which are to be answered for home work. In this way each new word is not only used in the oral lessons, but is learnt in its written form as well.

Syllabus for the Third Year (Class VI.).—Material: The scholars are now ready to tackle a simple French reading-book, and the book of short passages (Hardress O'Grady) is added, for reading as well as for composition. A few of these prose passages, after being thoroughly studied, are learned by heart. No other means is so useful for cultivating a French *Sprachgefühl*. A special difficulty is presented in taking French poetry for a similar purpose. While we select a few songs in Class IV. for the sake of pronunciation, when it comes to reciting and learning by heart there are few poems which will not carry the scholar, as regards vocabulary and style, too far from the range of expression and ideas to which he is limited in these early years. (In this respect German has an advantage over French.) Hence it is only in the final year that much attention is paid to poetical literature. (See summary above.)

Grammar.—This reading material provides a basis for further study of language forms. The teacher considers what features of grammar need most attention in each story, and every such feature receives "intensive" treatment. It is not wise to spend a little time on a variety of new topics in grammar; each should be thoroughly practised before another claims attention. The study of grammar or *form* is not an end in itself; it is only a means to enable the scholar to use and read the language with greater ease and accuracy. The use of Hartog's *Grammaire Française* is now permitted, but it is more extensively employed in the final year. The thing that matters is that the scholars should understand and be able to *use* rightly the particular form emphasised. *Use* is the key-note throughout in the study of the form of the language, not the formulation of rules and the learning of them by heart, though that has its place. (See Findlay, *Principles of Class Teaching*, Chap. XV.) One of the first topics to be taken up will be the use of the *imparfait* and *passé historique*; another the passive form of verbs, and so on. The order of these grammar topics will be determined by the difficulties which arise in each story as it is read.

Plan of Lessons.—The story, or some small part of it, is told to the scholars orally, making use of the vocabulary they already employ. The meaning of new words and phrases is learnt, not by translation into English, but by a picture, a drawing, by suggestion, by action, or by reference to a copy of a French dictionary, which is kept in the classroom (Larousse, *Nouveau Dictionnaire Illustré*, 3 fr. bnd.). If all these methods of understanding the French word or phrase fail, then the teacher gives the class an English equivalent, for he must make sure that the class understands. The teacher should refrain from asking "*Comprenez-vous,*" which brings the answer—"Oui," whether they have understood or not.

The following passage would be treated somewhat on the following lines:—

LA PETITE BLANCHE NEIGE.

On était au milieu de l'hiver et les flocons de neige tombaient du ciel comme des plumes. Une reine était assise à coudre auprès de sa fenêtre ouverte dont le châssis était d'ébène, et tandis qu'elle cousait en regardant tomber les flocons de neige, elle se piqua le doigt, et trois gouttes de sang tombèrent sur la neige.

This passage is preceded in the text-book by a picture of the queen sitting at the open window before her embroidery frame. The best introduction therefore is for the scholar to study the picture and describe what he sees in French.

Regardez le tableau. Que voyez-vous, Jean? Je vois une femme, Monsieur.

Qu'est-ce qu'elle porte sur la tête? Elle porte une couronne.

Comment s'appelle une femme qui porte une couronne? Elle s'appelle une reine.

Comment s'appelle la reine d'Angleterre?—Est-ce que la reine est debout? (Etre debout is explained as follows:—Levez-vous, Jeanne. Jeanne est debout. Asseyez-vous, Jeanne. Est-ce que Jeanne est debout maintenant? Non, Monsieur, Jeanne n'est pas debout, elle est assise. This will be repeated in reference to other scholars.)

Est-ce que la reine est debout? Non, la reine n'est pas debout, elle est assise.

Où est-elle assise, auprès de la porte? Non, Monsieur, elle est assise auprès de la fenêtre.

Où êtes-vous assise, Marie? Je suis assise auprès de la cheminée.

Et vous Georges, où êtes-vous assis? etc.

Bien, la reine est assise auprès de la fenêtre. Est-ce que la fenêtre est ouverte? Oui, Monsieur, la fenêtre est ouverte.

Que fait la reine auprès de la fenêtre ouverte? (This will probably have to be answered by the teacher.) Elle regarde par la fenêtre. Guillaume, regardez par la fenêtre—que voyez-vous? (repeat with other scholars). Que voit la reine par la fenêtre ouverte? This will have to be told to the class: the scholars can repeat the answer several times and then the "proposition" (see Report on Grammatical Terminology) can be written on the board and the words "*flocons de neige*" explained by showing a picture of snow falling thickly "*comme des plumes*."

D'où tombe la neige? La neige tombe du ciel.

En quelle saison tombe la neige? En hiver.

Est-ce que nous sommes en hiver maintenant? etc.

Au milieu de l'hiver can be explained by reference to the hours of the day. A six heures du matin on est au commencement de la journée; à dix heures du soir on est à la fin de la journée; à midi on est au milieu de la journée; or in another way by showing on a diagram the spatial meaning of *au milieu*—*au milieu de la salle*. Jean est assis au milieu de la salle.

Continuing:—Que tient la reine dans la main gauche? (This again must be answered by the teacher.) Elle tient dans la main gauche une aiguille et un fil de soie. (The teacher will have a needle threaded.) Qu'est-ce qu'elle fait avec l'aiguille. (Again answered by the teacher and repeated several times by the class.) Elle coud avec l'aiguille. Que faites-vous, Jeanne, avec une aiguille? Je couds avec une aiguille (after being told by the teacher).

Alors vous cousez avec une aiguille, Jeanne. Que fait la reine avec une aiguille?

"Piquer le doigt" and "trois gouttes de sang" can be explained by the teacher actually pricking his finger and asking

the question:—*Qu'est-ce que j'ai fait? Je me suis piqué le doigt, et les gouttes de sang sont tombées sur le plancher.*

The scholars have now got the general sense of the passage and practically all the new words have been explained. The teacher now reads the passage to the class slowly and distinctly several times. Individual scholars, or all the scholars together, read the passage, the teacher setting the model for each sentence. For other examples of method of treatment see Walter, *Zur Methodik*, pp. 6-8, 24ff., 31ff., *Aneignung*, pp. 17ff.

After the passage from the text has been thus treated as matter to be understood simple questions are put to the class, requiring answers more or less in the words of the passage. Questions should also be asked which require an answer in words other than those of the text, or which require the giving of a fairly long paragraph in response. The scholars should also get practice in framing questions themselves and putting them to their classmates.

Gradually the scholars will be able to give an account in their own words; they should be encouraged to do this as much as possible, for they are really engaged on "French composition." After such oral exercises in composition the scholars prepare a written version. The same passage is often treated from the point of view of grammar. (See above.) Further exercise in composition is secured in connection with Hart and Hardress O'Grady's *Steps*. After reading one of the longer stories in *La Petite Blanche Neige* the class can very well spend a week in reading one of the stories in the *Steps* and working the exercises in "free" composition. More time than formerly is devoted to writing, but the written exercises continue to be prefaced by oral treatment. By the end of this year the class should be able to give a continuous account in French of a story after it has been read and discussed.

Syllabus for the Fourth Year (Class VII.).—The scholars have now studied French for three years, and should have acquired considerable facility in reading, speaking and writing the language. They are now allowed to read quickly two or three short French books, such as those offered in Blackie's *Little French Classics*. (One at least of these should treat of

incidents in French history; compare Humanities syllabus.) Hitherto they have read *intensively*; now they are expected to read *extensively*. This helps them to acquire an all-round vocabulary and practice in gaining the general sense of a passage.

A dictionary (in French) is now purchased by each scholar, and he learns to use it as he needs. Only the more difficult passages of a text should have much attention in class, but the whole book is available as a basis for questions on subject-matter and free composition (both oral and written).

SYLLABUS FOR THE YEAR'S COURSE IN GERMAN (CLASS VIII.)

Pronunciation.—Since the symbols of written German correspond so consistently with the sounds no serious difficulty is felt, and as there is only one year at our disposal time is not taken for analysis and classification as in the French Course. (See p. 160.)

(i.) *Material.*

(a) Names.—Wie heisst Du? Wie heisst er? etc.

(b) Ages.—Wie alt bist Du? Wie alt ist er? etc.

(c) Birthdays.—Wann hast Du Deinen Geburtstag?

(d) Date.—Was ist heute? Was war gestern? Was wird morgen sein?

(ii.) *Classroom phrases.*—Ich stehe auf, ich mache die Tür auf, ich mache das Fenster zu, ich mache das Pult zu, ich schreibe auf der Tafel . . . etc., etc. The phrases will be worked out as "Gouin Series" (see French Course, *D.S.R.*, No. 1) and the present, past and future tenses learnt, *e.g.*:—

Heute schreibe ich auf der Tafel.

Gestern schrieb ich auf der Tafel.

Morgen werde ich auf der Tafel schreiben.

(iii.) *Deutschland.*—One of the maps (Deutschland-Politisch) in the series published by Armand Colin (Paris), with the names in the language of the country.

(iv.) General topics, introduced as occasion permits and as suggested by incidents of real interest at the moment. The weather, a visit of the Imperial Family or of German Bürger-

meister to England, are examples of what is here intended. While freedom of choice is here left to the teacher, it should be noted that any such topic when once selected is treated with the same care and thoroughness, as regards vocabulary and construction, as the rest of the Syllabus. It is waste of time for a teacher to introduce words and phrases which the scholar is only expected to grasp imperfectly.

(v.) *Songs*.—Since popular music has played so distinctive a part in German culture, our purpose can scarcely be achieved if this feature be omitted. It is true that some of the boys' voices are beginning to break, but their interest in music is not thereby diminished. We make use of songs from the first week and introduce them usually in connection with seasons and festivals of which the German people make so much. *Erks Deutscher Liederschatz* (Peters, Leipzig) provides us with a wide range of songs.

(vi.) Sections i., ii. and iii. take from four to six weeks (four lesson periods per week) to exhaust, and the class is then ready for a simple reading book:—Miss Guerber's *Märchen und Erzählungen* (Heath & Co.). This contains a number of Folk Stories written in a style easy to follow; there is much repetition of phrases, in each of which some slight alteration has been made. Poems connected with the stories are learnt by heart, e.g., Goethe's *Rattenfänger von Hameln*. (Their previous acquaintance in English Literature hours with Browning's *Pied Piper* adds to the interest.)

Grammar is begun as a separate study as soon as the scholars tackle the Reader. Thus, while reading the first story, *Jakobs Haus*, two or more tenses demand notice, the *perfektum*: *ich habe ein Haus gebaut*, and the *plusquamperfektum*—*ich hatte ein Haus gebaut*.

Temporal clauses can be studied in the same connection—Ehe *ich Korn kaufte*, *baute ich ein grosses neues Haus* or *nachdem ich ein neues Haus gebaut hatte*, *kaufte ich viel Korn*, etc. (See Schweitzer "*Méthodologie des Langues Vivantes*.) The study of the above two tenses and the Temporal clauses might also be introduced in Section II., e.g.:—Ehe *ich die Tür aufmache*, *verlasse ich meinen Platz* or *ehe ich auf der Tafel schreibe*, *nehme ich ein Stück Kreide in die Hand*, or *ehe ich an meinen*

Platz zurückgegangen bin, habe ich die Tafel abgewischen, or nachdem ich die Tafel abgewischen hatte, ging ich an meinen Platz zurück.

Right from the beginning the scholars have had practice in the position of the verb in simple sentences and in subordinate clauses. Further practice in this will be afforded in the "questionnaire," so that the scholars will finally have no difficulty in using the verb in the right position.

The declension of adjectives and nouns should be practised together, *e.g.*:—Das grosse Haus, der kluge Mann, die warme Milch. The nouns should be declined as they occur and written down in a special Grammar book, each noun in the class to which it belongs:—Weak Feminine, Weak Masculine, Strong Masculine with Umlaut in Plural, etc.

The use of the auxiliary verbs—müssen, dürfen, können, mögen, etc., must receive attention.

Other grammatical features which require attention will suggest themselves during the reading of the stories; for example, the Passive form of verbs. Throughout, German grammatical terminology is used. (See "Report of the Joint Committee.")

Reading and Writing are practised from the first, but oral treatment always precedes visualisation. Composition (first oral then written) finds scope in the first section of the Material, where one scholar will use his scanty vocabulary to say what he can about his neighbours—name, age, birthday, height, colour of eyes, etc. Other lessons will produce a description of the classroom, number of scholars, position of windows and door, pictures and the like. Continuous description and record is an essential feature of all the earlier work, since it makes a call upon the active purposeful interest of the learner. When the Reader is begun, the methods already described for composition in French are easily adopted, for the scholars are already familiar with them. It should be added that the Gothic script is not employed in writing; there seems to be no adequate reason for troubling to acquire it.

C. E. STOCKTON.

PART IV.

SCIENCE AND MATHEMATICS.



CHAPTER XII.

NATURAL SCIENCE (INCLUDING PHYSIOGRAPHY).

Science as a branch of the school curriculum is peculiarly difficult both with respect to subject-matter and method. The multiplicity of scientific facts which may be taught is a hindrance rather than a help, while the generalisations and laws of Science, which would seem to be a guide to method, are abstract, remote and elusive to the mind of the child.

What, then, shall be the criterion of selection so far as the facts to be taught are concerned? Shall "Nature," botanical and zoological, be studied? or shall Physics, the basic science of modern industries, be the objective? In method, shall the "practical" be chosen? or shall "observation" satisfy the child of elementary school age?

If the growing experience of the child is considered it is found that some scientific facts lie nearer to him than others. The plants and animals of the home and its immediate neighbourhood, facts about the weather, hot-water systems, and so forth are much more a part of his experience than are physiological facts or chemical formulæ. Since the teacher must perforce use this experience as the starting-point in the acquirement of new knowledge the selection of material for Science teaching ought to take account of it. The syllabus outlined below endeavours to do this by selecting only those parts of science which have close human relationships. The unifying factor of the course is, therefore, not this or that specific science or scientific classification, nor is it the work done by the teacher, but it is the felt need of the child living in a complex environment in which science plays an extremely large part. But Science is orderly and progressive, not haphazard and disjointed; hence the scheme is organised to permit (a) of a careful and thorough searching out of facts; (b) of a systematic selection and arrangement of these facts, and (c) of an orderly progression in difficulty commensurate with the developing maturity of the scholars.

Method in science is thinking in science. The underlying problem is—how to get the scholars to think in science. Hence problems must be raised and investigated experimentally. Practical work is not to be looked upon as a thing apart but as a vital method of inquiry into the nature of real problems. Hence laboratory exercises and work in the garden are not separated from the work of the classroom, but are associated, and, so far as possible, the whole of the Science work is of the practical laboratory type: the generalisations reached as a result of individual practical investigations are the only statements considered worthy of emphasis or memorisation.

An objection might be raised that children of seven or eight years of age cannot experiment; the most that can be expected of them is that they shall be able to make simple observations which will develop later into more critical examinations. But the difference between observation and experimentation is not of kind but only of degree. Observation consists of the practical investigation of phenomena over which little or no control is exercised or is even possible. Observation of the weather and of the growth of trees are good examples of this type of investigation. If, now, we begin to control observations, or, rather, make certain phenomena occur at our bidding, we get experimentation. Experimentation is controlled observation; extraneous factors are eliminated, and the phenomena germane to the problem at issue are brought into situations easy of observation. The higher the form of experimentation the greater is the delimitation of the field. Further, experimentation is more difficult with living organic material than with dead inorganic matter, with animals than with plants, with human beings than with the lower animals, and with groups of living beings than with solitary ones.

Experimentation is thus more difficult for a child than is observation. Moreover, the nervous mechanism needs to have reached a fairly advanced stage of development before the delicate manipulations necessary for experimentation can be performed. Further, the native interests of children are concerned with living things, especially animals, rather than with the phenomena of physical change. For these reasons, and the additional one that experimentation in any natural science

is at bottom dependent on measurements of physical changes, this course in Science begins with observations in biological nature study, coupled as it is with the care of animals and simple work in the school-garden rather than with measurement of physical effects and phenomena. The elements of Physics and Chemistry are left to the later periods of school life.

The part that language plays in the growing appreciation of scientific facts has also been given due consideration. Thought and language develop in close relationship; in fact, it is a debateable point if any thinking can take place except through the instrumentality of language. Hence the early stages of Science must provide real and natural situations for language development. There must be an orderly progression in abstract thought as well as in manipulation, in scope, and in intensity of the work in science.

Such are a few of the considerations which influence the course in Science as pursued in the Fielden School. The present scheme is one of gradual growth. Six years of trial have shown the strength and weakness of the original scheme. (*D.S.R.*, I, chap. iii.)

Although the sections are set down in logical order of subject-matter this does not necessarily mean that the arrangement should be rigidly adhered to in the actual teaching of the sections. The knowledge already acquired by the class, and other points concerned with "method," will dictate the actual procedure in the classroom.

ADDITIONAL NOTE ON THE PHYSIOGRAPHY PORTION OF THE SYLLABUS.

It will have been noticed that Geography as a separate branch of the curriculum has been omitted from the present syllabus. This does not mean, however, that the study of the earth has been overlooked or thought unimportant. Too often in the past the term Geography has been used to describe a mass of information including something about every part of the world, which is imparted to the scholar year by year as he passes up the school. The selection of material was based on

the maximum amount of information about the world which could be learned in the limited time apportioned to the study of Geography, an increase in this time meaning the possibility of including more and more detail about the various countries studied.

It is largely to escape from the idea that Geography means the acquiring of a certain number of facts about the earth that the word "Geography" has been dropped and the study of the earth in its physical aspect has been included in the Science syllabus under the term "Physiography" (employed after Class II.).

In the first place, one desires to give the scholar not a fund of information but a geographical habit—a power to make use of fundamental geographical principles which, with the help of a good atlas and a gazetteer, will enable him to make an intelligent study of any part of the world. Much of the information given in Geography text-books necessarily changes from year to year, but the principles governing such changes remain the same.

Thus we are led to a new basis for the selection of material. We do not begin with the extent of the present knowledge of the earth but with the needs of the scholar in his studies. This need is two-fold. Firstly, actual facts must be examined before principles can be formulated, and this is the first type of material. Secondly, in studying the development of man in the Humanities Syllabus a knowledge of the environment of man is constantly required. (This is fully discussed in the introduction to the Humanities.)

From the first we depart from the notion that some knowledge as such of "the world as a whole" is to be directly imparted. A general idea of the globe is indeed required, but from the point of view of the governing factors at work therein rather than a knowledge of individual regions.

There may appear to be at first sight a separation of the human aspect from the physical aspect of the earth, due to the placing of the physical nature of the earth in the Science Syllabus and identifying the earth as it affects Man with the Humanities. This is not really so, for the same scholars are engaged on both these syllabuses. In the syllabus of "Earth

Knowledge" the human aspect is constantly cropping up; e.g., the scholars enquire how the material world has helped or hindered man's progress, and so forth. For example, in studying America as a typical continent, the scholars consider the uses man has made of the physical conditions; the region is studied so as to bring out the general principles governing the relation of man to his environment rather than to make a definite study of America. The course is based on the scholars' observation of their immediate environment. They study rain, streams, hills and other physical phenomena. This observation is at first crude, but as the scholars pass up the school it becomes more exact. The intention is that they shall form regular habits of observing natural phenomena, and for this reason one or two observations daily throughout the year—holidays as well—will be of more value than a single term's observations.

The field of study gradually extends to the British Isles, a natural area which is treated as illustrating many principles affecting man's relations to his environment. In Class VI. a definite study of a continent (America) is undertaken in all its aspects—human included—to bring out well-defined principles, such as factors governing the vegetation of a country and hence its inhabitants.

Having formulated these principles, practice must be given in their application, and they are used in solving the problems involved in the study of Europe in Class VII. New principles are discovered, perhaps, which the consideration of America did not bring to light.

Meanwhile, in the Humanities, the pupils are learning the geographical facts necessary to the understanding of the progress of the human race. As far as possible the typical regions studied in this Science course (physiography) coincide with the geographical knowledge required in the Humanities, but the required facts are taught *with the Humanities* and not in the scientific course. Nevertheless, the power of obtaining these facts depends largely on the geographical principles acquired in the study of physiography, as outlined below.

Thus this course is not a handmaid to the Humanities; rather be it said that on the physical side geographical ideas are

developed which are drawn upon for the purposes of history; and the knowledge gained in both these fields will, we trust, be so acquired as to be of service, as need arises, when school days are over.

Scholars' Reading in Connection with Physiography.—It will be understood that as the scholars advance up the school they are expected more and more to reason upon the geographical data provided by maps and other apparatus. Hence little use can be made of ordinary text-books, for these supply arguments instead of creating a situation which compels the scholar to do his own thinking. But books of a more literary and descriptive character will be supplied in the Class Library, and the following are available in Classes V., VI., VII.

(1) F. D. & A. J. Herbertson : *Descriptive Geography from Original Sources*. (2) Brown & Johnson : *How People Live*. (3) H. J. Mackinder : *Our Own Islands*. (4) Cecil H. Crofts : *Britain on and Beyond the Sea*. (5) Speight & Nance : *Britain's Sea Story*. (6) Whymper : *Scrambles Amongst the Alps*. (7) Miss Newbigin : *Man and His Conquest of Nature*. (8) Arnold's Local Readers : *The Story of Lancashire*. (9) Brown & Johnson : *The Home of Man*.

In Class VII. Reynolds' Regional Geography is being introduced as a book which proposes problems as well as aids in their solution.

Ordnance Maps. The 6-inch to the mile of the school neighbourhood is on the walls of Class III. In Class V. the 1-inch is regularly used (a copy for each scholar), especially for the study of contours, and in Class VI. again for field work.

Each scholar uses Bartholomew's Comparative Atlas.

THE TIME TABLE.—An average of four periods per week (roughly, about 160 minutes) is allotted to this syllabus of Science, including Physiography, but the teacher is recommended sometimes to take all the four periods for one problem in Physiography, and to continue it even for three weeks until complete, then to drop Physiography for a time and devote the whole of the four periods to one of the Natural Science sections. This we call the "intensive" plan (p. 43).

REFERENCES.—The following books are recommended for students' reading, but various popular books on Science (especially relating to plants and animals) are placed in the class libraries. (See p. 31.)

(N.B.—The scholars do not use a text-book.)

GENERAL.—(1) Huxley : *Essays and Addresses*, especially "On Science and Art in Relation to Education." (2) Spencer : *Education—Intellectual, Moral and Physical; Scientific Essays; First Principles*. (3) Armstrong : *The Teaching of Scientific Method, and Other Papers on Education*.

SPECIFIC.—(1) Hodson: *Broad Lines in Science Teaching*. (2) Dobbs: *Weighing and Measuring*. (3) Earl: *Practical Exercises in Physical Measurement*. (4) Jackson: *First Year Physics*. (5) Perkin and Lean: *Chemistry*. (6) Grant: *Practical Geometry, including Mensuration and Scale Drawing*. (7) Dunstan: *Elementary Experimental Chemistry*. (8) Shelley & Stenhouse: *Life and Health*. (9) Thomas on *The Teaching of Hygiene in Norwood & Hope's Higher Education of Boys in England*.

REFERENCES FOR THE SYLLABUS IN PHYSIOGRAPHY.—Specific references to books have been made throughout the scheme. The teacher should also be familiar with some of the following:—(1) Geikie: *The Teaching of Geography*. (2) H. R. Mill: *The Realm of Nature*. (3) Simmons & Richardson: *An Introduction to Practical Geography*. (4) *Manual of Map Reading and Field Sketching*, issued by the War Office. (5) Mill's *International Geography by Seventy Authors*. (6) *The Guide to Geographical Books and Appliances* issued by the Geographical Association is in the Departmental Library, and should be carefully studied.

The following books on Local Geography (some of them include History also) are worth consulting:—(1) *The Marlborough Country*. (2) J. Holden: *A Short History of Todmorden*. (3) Lewis: *Typical School Journeys*.

SYLLABUS OF SCIENCE COURSE (INCLUDING PHYSIOGRAPHY).

CLASS III.: *Section A.* NATURE STUDY.—The science of Class III. is best described as Nature Study. Plants, animals, the weather and so forth are studied. Practical work in Gardening and in the care of animals is undertaken. A Nature Diary is kept by each scholar, and a Class Diary is available for entries by all the scholars in the class. The branch is thus subdivided as follows:—

(a) Plant Life.

(b) Animal Life.

(c) Keeping of Nature Diaries and Charts.

(d) Excursions (partly in connection with the Humanities).

The method used is mainly that of observation with subsequent writing-up of records. Records, as far as possible, are kept by means of drawing and painting. The two aspects of plant life—(1) that of the propagation of the species and (2) the use man makes of plants—are clearly differentiated. A detailed study of the common trees found in the school grounds and in the neighbourhood is included.

Section B: Study of a Stream and the Action of Rain:—

(i.) Study of the playground after rain to illustrate the cutting of channels and formation of valleys.
(Position of playground laid out with clay and sand to represent hills and valleys.)

(ii.) Hard and soft rocks, illustrated from Gore Brook.

(iii.) Visits to Gore Brook to observe the character of the bed of the stream, the winding course of the stream, the building-up and denudation of river banks, weathering.

(iv.) Main geographical terms used in connection with rivers.

This will entail outside work in measuring. Rough sketches may be made outside with measurements and a more careful plan in the classroom. (See Mathematical Syllabus.)

REFERENCES.—(1) Tarr & McMurry: *Home Geography*, chap. xi.
(2) The New Outlook Geography, *How People Live*, chap. ii. (3) Simmons & Richardson: *Introduction to Practical Geography*, chap. v.

Section C: Plans as an introduction to maps:—

- (a) Plans of objects in classroom; e.g., ink-wells, boxes.
- (b) The classroom drawn to scale.
- (c) School buildings.
- (d) School grounds and adjoining streets.
- (e) Victoria Park, with main roads. Reference made to Ordnance Survey Map of the district, 6in. to the mile. Other Ordnance Survey Maps of the district are available in the classroom.

Each scholar has a map of Manchester.

Section D: General idea of Home District:—

- (a) Model of the Irwell Valley.
- (b) Nature of the country.
- (c) Distribution of population, with reasons.
- (d) Map of the Irwell Valley. (Compare with model.)
- (e) The need for canals.
- (f) Visit to the Bridgewater and Ship Canals.

Observational Work throughout the Year:—

- (a) Record of rainy days kept.
- (b) Use of the compass in field work.

CLASS IV. : A. BEGINNINGS OF BOTANY.¹—The work in Class IV. adds to, and begins to arrange, the observations of plant life made in Class III. The new starting point is the green-grocer's shop, and answers are sought to enquiries as to what parts of the plant we eat. From these answers the main organs of the higher plants are realised, and by observation (helped by drawing) and experiment something learnt of their forms and functions. Short statements are written in Exercise books.

Section I.: (September) Kidney beans.

- (a) The whole plant, roots, stem and leaves (including flowers and fruit).
- (b) Fruits of pea, broad-bean; also laburnum and sweet pea, leading to definition of legume.

Section II.: Celery plant: roots, stem and leaves. We eat leaf-stalk and part of stem.

¹We are indebted to Miss Caroline Herford for kindly supplying this portion of the syllabus.

Section III.:—

(a) Stems that we eat: potatoes, artichokes, onions.

(b) Root-stems that we eat; carrots, turnips, parsnips, horse-radish, beet-root, radishes.

Experiments: growing green leaves from slice off top, kept in water.

Section IV.: Tabulation of contents of greengrocer's shop under headings, leaves, stems, fruit, etc.

Section V.: Work of roots:—

(a) To fix plant in soil.

(b) To take in water and food dissolved in water.

Experiments: White flowers with stalks in coloured solution.

Race between equal-sized Fuchsia plants—one grown in distilled water, the other in culture solution.

Section VI.: Work of leaves:—

(a) Feeding leaves.

(b) Flower leaves.

Experiments: Testing for carbon di-oxide in air, and for starch in potato and green leaf. Examination of tulip, buttercup, wallflower.

B.: PHYSIOGRAPHY (now differentiated from other Nature Study).

Sec. I.: *Typical River Basin.*

(a) Mersey and tributaries. This basin will be modelled and a map drawn from it. Establish the connection between mountain, valley and coast. How the denuding action of the river affects the coast. The silting-up of the estuary. The formation of sandbanks at the mouths of Mersey and Dee.

The Ordnance Survey Map showing the sandbanks will be consulted.

Sec. II.: *Western Pennine Slope* (Lake District to N. Wales).

(a) General build of district.

(b) Comparison of the various valleys, *e.g.*, Lune and Ribble with Mersey and Dee. Speed and navigability of rivers. The lakes.

- (c) Natural resources. Coalfields: their position, and relation to the distribution of population. Geological conditions for the occurrence of coal.
- (d) Climate as related to the manufacture of cotton.

Sec. III.: *Eastern Pennine Slope.*

- (a) General build from Tweed to Humber. Pennines as a watershed. Comparison of the two slopes.
- (b) Ouse basin, as illustrating various pursuits according to the nature of the country. Sheep-rearing on hills. Cattle in valleys and agriculture on the York plain.
- (c) Comparison of E. and W. Coasts. Account for the differences.
- (d) Comparison of centres of population in Yorkshire and Lancashire.
- (e) Means of communication. Use of gaps in the Pennine Chain.

REFERENCE.—Welton: *Principles of Teaching.* (Chapter XI. on Geography.)

Observation Work.

- (1) Record of wet days and direction of wind on "circular wind chart" so as to bring out the relation. These will also be used in Class V.
- (2) Hot and cold days recorded and compared with other records.
- (3) Speed of rivers. An experiment can be attempted in Gore Brook to find the speed when in flood and at ordinary times.

CLASS V.: A. NATURE STUDY.—The Water Cycle is taken as a general theme for the entire year.

I. Rain Water, Properties of—

- (a) Sooty matters in suspension and their removal—
 - 1. By settling: the rain barrel.
 - 2. By filtering: sponge, porous tile, sand, and paper filters.
- (b) *Dissolved matters*—
 - 1. Gaseous.

NOTE.—The syllabus of Class V. follows up the Physiography and Nature Study of Classes III. and IV.

2. Solid (small in quantity, as can be shown by evaporation to dryness).

II. Quantity of Rain which falls.

The rain gauge. Construction of a rain gauge. Graduation of a test-tube to show inches of rainfall. Distribution of rainfall in various parts of the world.

III. Spring Water.

(a) Amount of suspended matter: comparison with I. (a).

(b) Substances in solution. Experiments to show presence and amount. Comparison with I. (b). Hard and soft waters compared by finding least quantity of a soap solution which will create a permanent lather with the same quantity of each water. Use experience of washing in hard water. Temporary and permanent hardness. Methods of softening water. Deposits on kettles and domestic boilers (furring).

IV. The Manchester Water Supply.

Tracing supply from Thirlmere and Longdendale to the Manchester sewers, sewerage works and river Mersey. Protection of the sources. Filtering the supply. Modes of contamination and its effects. Filtration from bacteria. The amount used. The reservoirs. The house tanks, drains, etc., illustrated from house system of Fielden School and the scholars' homes. The sewer system of a city.

V. Sources of Water Supply for Domestic Purposes.

Deep wells, surface wells, springs, rivers, lakes, rain. Detection of organic matter by potassium permanganate. Special danger of shallow wells near agricultural land. Drainage of cesspools and leaky drains into water supply. Necessity of periodical cleaning of storage tanks, filters, etc. Water, if thoroughly boiled for 15 minutes, may be regarded as safe to drink, but not otherwise unless from a safe supply.

VI. Formation of Springs.

Pervious and impervious rocks. Elementary geological ideas of the strata of Northern England (water supply at School Camp).

VII. River Water (with reference to local geography).

(a) Suspended matter. Comparison with I. (a) and III. (a).
Amount of suspended matter when river is in flood.

(b) Dissolved matter. Comparison with I. (b) and III. (b).

Samples of water from Gore and Todd Brooks. The rivers Mersey and Medlock to be compared.

Specimens of water from portions at known distance from source (Pictorial Graph).

VIII. The Work of Rain, Springs and Rivers.

(a) Cleansing of air by rain.

(b) Denudation. Formation of valleys and canons. Speed of rivers. Rivers in flood. Mountain torrents and lowland rivers. Waterfalls. Formation of spherical boulders and pot-holes. Changes in the course of a river (local rivers visited). Erosion of banks. Deposition on level ground. Silting.

(c) Dissolving action. Formation of limestone caves and underground streams. Cheshire salt.

IX. Sea Water, Properties of—

(a) Solids in solution and their origin.

(b) Why sea is salt. Salt lakes and inland seas.

(c) The work of sea water. Denudation of the coast. Sea caves. Formation of pebbles and sand. Tides. Deposits of sand on shelving shores. Sand bars and deltas. Dredging.

X. Distillation of water, involving

(a) Evaporation.

(b) Condensation.

Purification of water by distillation. Natural distillation. Clouds. Fog. Mist and dew. The steaming of windows.

XI. Ice and its Work.

Frost. Effect of cold on water. Changes in volume. Why ice floats. Freezing of water in an iron bomb and other experiments. Effects of frost on rocks, trees, etc. Fall of leaves and formation of screes. Glaciers and glacial action. Glacial valleys and lakes.

B.: PHYSIOGRAPHY.

Sec. I.: *Contours.*

The meaning of contour lines is introduced here in a simple manner, and contours will be used frequently in future. They can be illustrated by the use of an ideal model of a hill in a sand-tray, marking different heights round the hill and drawing a plan. The levels may be determined by pouring water into the tray or by using wooden pegs of varying heights driven into the sides of the hill. The scholars become familiar with the method of colouring maps for different altitudes, and should realise by actual field work what a hundred feet in height means. This may be done by a journey into the country (during camp, for example) and measuring the height and drawing the contour lines of a hill by the use of scout poles and other simple apparatus.

REFERENCE.—Simmons & Richardson, chap. iv.

Sec. II. *The British Isles as a Whole.* This will be studied as a natural region to bring out the factors which govern the English climate and the influence on the productions.

(a) *Structure.* The British Isles as the edge of the Continental shelf. Character of various natural regions of British Isles, contrasting the flat plains of the East with the hilly West. Compare similar regions, e.g., Highlands of Scotland with the Westmoreland hills and the Welsh hills.

(b) *Climatic Conditions.* The weather records of Classes III. and IV. can be made use of. Also records of rainfall in Manchester (see above).

(1) *Winds.* Wet and dry, with frequency throughout the year. How rain is formed. Why a hilly district has a greater rainfall than a plain. (Rain records in inches for various districts to be compared.)

(2) *Temperature.* Temperature as affected by winds.

(c) *Productions.* General idea of the conditions favouring the growing of corn, oats and other grains. Suitability of various districts for grain, cattle, or sheep-rearing. Maps to represent this.

REFERENCES.—(1) Lyde: *School Text Book of Geography.* (2) Mill: *International Geography.*

Sec. III. *The Earth as a Sphere.* (In connection with the history of discovery in the Humanities Syllabus.)

- (a) Shape and size of the earth. Position in respect to Solar System.
- (b) Divisions of the earth. The scholars can themselves discover a means of dividing up the surface of the earth. (In connection with this a cardboard model of the earth on a wooden frame is constructed—[see Handicrafts Scheme]—and the lines of latitude and longitude are drawn on it.) Compare Mathematics Scheme:—Angles.
- (c) Cause of day and night. Illustrated in the laboratory by means of globe and electric lamp.
- (d) The Seasons. Why the 'equator' is hot and the 'poles' cold. Causes of the differences in duration of day and night throughout the year. This is illustrated by observing the length of the shadow cast by a stick at noon at different times of the year.
- (e) Winds. The cause of winds will here be discussed and the chief types of prevalent winds noted. This is a mere working knowledge. The movements of the air are studied fully in Class VII. (See p. 197.)

REFERENCES.—(1) Simmons & Richardson, as above. (2) Mill: *International Geography, Preliminary Section.*

Observation Work.

- (1) *The Sun.* Altitude at different times of the day and year. A simple sundial will be constructed and the hours marked on it.

REFERENCE.—Simmons & Richardson, chap. x.

- (2) *Latitude.* Finding of latitude from sun and N. star.
- (3) Discovery and use of Compass. (See Mathematics Scheme:—Angles.)
- (4) Either in Class V. or Class VI., according to opportunity, the children should make an attempt at map-making by the use of a base-line and triangulation. This is best done during camp, where the work can be spread over two or more days.

REFERENCE.—Simmons & Richardson, chap. v.

CLASS VI.: A. NATURAL SCIENCE.—General Theme: Elementary Physics.

NOTE.—This syllabus is closely associated with the practical work in mathematics (see Chapter XIV.). A selection is made from the following:—

I. Measurement of length.

(Worked out in connection with the arithmetic of Class VI.)

II. Measurement of area.

To find areas of square, rectangle, parallelogram, triangle, any rectilinear figure, circle, surface area of cylinder and flat ring. Use of squared paper in measurement of area. Use of simple algebraical formulæ. No. of sq. cms. in a sq. inch.

III. Measurement of volume.

(a) Volume of a rectangular block of wood. Reason for selecting the cube as the unit for measuring volume and capacity. Make cubes of clay, putty or plasticine and show that, when distorted, they still occupy the same amount of space and hence may still be measured in rectangular units. Number of cubic centimetres in a cubic inch.

(b) Volumes of other regular solids, such as cylinder, cone, sphere.

(c) The graduated cylinder. Use in measuring volumes of liquids. Limits of accuracy in using the graduated cylinder.

(d) Measurement of volume of regular and irregular solids which are insoluble in and (a) sink, (b) float in water.

(e) To find the diameter of a cylindrical jar from the height and volume of the water it contains.

(f) To find the diameter of a wire from its length and volume.

(g) The burette—a more finely graduated cylinder. Volume of small bodies, such as pencils, glass rod, nails, peas, etc., by displacement of water in burette.

IV. First notions of force, weight, mass and relative density.

- (a) Simple treatment of force of gravity. Equal weights are those that stretch a spiral spring or an elastic cord to equal extents.
- (b) Experiments with simple lever or see-saw. Equal weights balance at equal distances from the turning edge. Use of balance. Rules to be observed in weighing. Weights of equal cubes of different substances.
- (c) Weights of 30, 40, 50 ccs. of water measured from pipette leading to fact that one cubic cm. of water weighs one gram. Repeat the experiments with lukewarm and hot water.
- (d) Weigh volumes of milk, spirit, brine, watered milk, skimmed milk, beer, tea, mercury, etc., and calculate the weight of 1 cc. of each. Amount of cream in 100 ccs. of milk by standing in graduated cylinder.
- (e) Find the weight and volume of a fresh egg. Hence find weight of 1 cc. Make a strong brine solution and notice that the egg will float upon it. Carefully dilute brine until egg just doesn't sink. Find weight of 1 cc. of this brine solution. A test for freshness of eggs.
- (f) Heavy and light substances. Must find weight of equal volumes of them. Relate weights by finding 1 cc. of each substance. Necessity for comparing all materials with one standard substance. Water as this standard. Simplicity of the metric system.
- (g) Use of a gravity bottle.
- (h) Weight of water displaced by a floating body. Amount of displacement by cork, wood, or wax determined by overflow-jar leading to discovery that a floating body displaces a quantity of water equal to itself in weight. Principle of Archimedes.

- (i) Float a test tube loaded with shot or sand in a graduated cylinder of water. Compare weight of loaded tube and weight of water displaced. Why do iron ships float? Simple hydrometer or milk float to show whether milk has been diluted with water.
- (j) Water finds its own level. Flow of water in town's supply. Balance columns of oil and water, mercury and water, spirit and mercury, brine and mercury in a U tube. Law of U tube. Water column is $13\frac{1}{2}$ times height of mercury column.

V. Pressure of the air.

- (a) Simple experiments to show the reality of the air. Gases with and without smell.
- (b) Air presses in all directions. Notions of pressure from bicycle pump, billows, sucker, etc.
- (c) The straight barometer, siphon barometer. Barometric records.
- (d) The siphon.
- (e) Boyle's Law.

B.: PHYSIOGRAPHY. GENERAL BUILD OF A CONTINENT.

Sec. I. *N. and S. America as a Whole.*

- (a) Position of mountains. Nearness to sea. Great depth of sea off the W. Coast. The volcanic belt.
- (b) Natural divisions of America. River basins and their extent.
- (c) Lakes. The formation of lakes as exemplified by the N. American lakes.
- (d) Action of large rivers—sediment. Contrast the Mississippi with the Amazon. (The class here apply the knowledge gained from the Natural Science Course of Class V.) The effect of tides in forming an estuary.
- (e) Tides. Causes of tides. General direction of tidal waves.

REFERENCE.—Mill: *International Geography, Preliminary Section.*

Sec. II. *Climate*. General study of climate, illustrated by N. and S. America.

- (a) Nearness to equator. Difference in climate as one proceeds from Alaska to Cape Horn.
- (b) Nearness to sea. Effect of sea on climate. Refer to other continents, e.g., Europe and Africa.
- (c) Altitude. Contrast climate at the summit of the Andes with that at the foot. The "snow line."
- (d) Ocean currents. Care should be taken not unduly to emphasise the effect of ocean currents. The Gulf Stream and the Labrador current contrasted.
- (e) Isotherms. Use of isotherms. (Scholars prepare maps for themselves.)

Sec. III. *Rainfall*.

- (a) The rainfall may be deduced from a knowledge of prevailing winds and the size of rivers.
- (b) Study and preparation of rainfall maps, wind maps.
- (c) Desert regions. Compare with Africa and Australia. Salt Lakes.

Sec. IV. *Vegetation as dependent on Climate*.

- (a) Belts of vegetation and their significance—the main products in relation to the position and climate of the region.
- (b) Vegetation maps prepared and compared with isothermal and rainfall maps. Children should arrive at a general notion of the products of tropical climates.

Sec. V. *Economic results of climate and rainfall*.

- (a) Centres of population—with reasons. The populous E. coast of the U.S. contrasted with the more thinly populated interior.
- (b) Ports. Rivers as means of communication.

REFERENCES.—(1) Mill: *International Geography*. (2) Tarr and McMurtry: *North America*.

Observation work throughout the year.

- (1) A daily record of temperature.

- (2) Daily record of rainfall, continuing the work of Class V. Rainfall to be studied in connection with the temperature.
- (3) Barometric pressure in relation to weather. Daily readings to be taken to serve as a basis for next year's work on atmospheric phenomena.
- (4) Phases of the moon to be noted in connection with the causes of tides.

CLASS VII.: A. NATURAL SCIENCE. Part I.—Heat, with special reference to weather observations and practical applications in everyday life. The work is selected from the following:—

- (a) Hot and cold sensations. The idea of heat passing to or from our bodies. The important applications of heat in our daily life, especially in warming and cooking.
- (b) Effects of heat on solids, liquids and gases.
 - (i.) Expansion and contraction of solids. Practical applications in fixing metal tyres on wheels, rivetting, laying of railway lines and telegraph wires, building of metal bridges, etc. The cracking of crockery, lamp chimneys, plates of a stove, etc.
 - (ii.) Unequal expansion of solids. Practical application in clocks and watches.
 - (iii.) Effects of heat on liquids. Rough idea of thermometry. The boiling-point of water at different pressures.
 - (iv.) Effects of heat on gases. Explosives.
- (c) The thermometer. Difference between heat and temperature. The making of a thermometer and the best liquids to use. Maximum and minimum thermometers. Visit to the Whitworth Park Observatory. The clinical thermometer and its use.
- (d) How heat is conveyed in solids, liquids and gases.
 - (i.) Conduction, radiation and convection. Illustrate by ways in which a gas jet loses its heat. Coat wires of iron and copper with wax. Bind the ends together and heat the junction. Show

that the heat is conveyed more quickly and further along the copper than the iron. Metals generally are good conductors of heat. Wood, glass, air and water are bad conductors. Difference in conducting power of linen sheets, calico sheets and blankets. Domestic applications of insulators and conductors of heat. Convection in gases and liquids. Ventilation, circulation of hot water in pipes, ocean currents, wind, draughts, etc. Radiation from sun, fire, etc. Use of radiation in cooking.

- (ii.) Radiation and absorption. Dull heating pipes, bright teapots. Black and white clothing materials. Thermos flasks.
- (e) Latent heat. Enormous importance of latent heats of fusion and evaporation to climate and life. Cooling effects of evaporation. The evaporation of perspiration on the skin and from leaves of plants. Life possible in equatorial regions much above the body temperature. Steam as a motive power; steam scalds; slow formation of ice; damp clothing, etc.
- (f) The unit of heat. Need for a unit. Heat capacity of various substances like water, metals, etc. Heating by hot water. Effect of heat capacity of water on climate, etc.
- (g) Heat as a form of energy. Heat energy, like matter, is indestructible.

Part II.—Some simple machines and how they work (leading to principles of mechanics).

- (a) The crow-bar, poker, pump-handle, see-saw, scissors, fire-tongs, weighing machines, the human arm, etc., as examples of levers. The three kinds of levers. Exercises on moments (with Mathematics syllabus).
- (b) The wheel and axle. Familiar uses in crane, windlass, etc.
- (c) The pulley and pulley systems.
- (d) The pendulum. How clocks keep time. Laws of the pendulum.

- (e) Centre of gravity. Method of finding it in a sheet of cardboard. Why bodies stand upright. Kinds of equilibrium. The balance of the body in walking, gymnastics, etc. The centre of gravity in ships, heavily loaded tram-cars, etc..

B.: PHYSIOGRAPHY. Europe.

Sec. I.: The General Build of Eurasia.

- (a) Triangular shape with peninsulas jutting to the south, e.g., India, Italy, Spain.
- (b) General build. Mountains radiating from the Alps—the great folds to be traced round the world.
- (c) The great natural divisions and general result of great mountain barriers, such as the Himalayas.

Sec. II.: Climate. To be deduced from known factors which govern climate. Isotherm maps. Difference in climate of various districts to be accounted for. The various winds will be discussed. (Sequel to Section III., Class V.)

Sec. III.: Vegetation Charts.

- (a) Charts to be constructed from given data.
- (b) General vegetation of countries in typical belts.

Sec. IV.: Characteristics of Natural Divisions.

- (a) Rhine Valley. Economic conditions from the source to the North Sea.
- (b) The Rhone Valley.
 - (i.) Glaciers and their work.
 - (ii.) Rhone Valley and the Mediterranean coast.
- (c) Danube Valley.
- (d) The Peninsula, Italy and the Balkan Peninsula, compared and contrasted.

Sec. V.: General Comparison of East and West.

- (a) Climate. Effect of different winds. Monsoons and ocean currents.
- (b) Reasons for different products. Differences in the staple food of peoples in different districts.

Observation Work.

- (i.) The weather. Cyclones and anticyclones. Study of weather charts as printed in the daily press. Storms and their causes.
- (ii.) Visit to school on three or four evenings during the year to observe the main constellations.

REFERENCE.—Simmons & Richardson, as above.

NOTE.—The course in Physiography is not continued in Class VIII., but Human Geography receives adequate attention. (See Humanities Syllabus.)

CLASS VIII. The work is selected from the following:—

A. Light.

- I. Rectilinear propagation of light. Pinhole camera, shadows, eclipses, sundial, etc.
- II. Reflection. The looking-glass. The laws of reflection. Lighting of rooms by mirrors, etc.
- III. Refraction. What is meant by it. Experiments to discover laws. Refraction through rectangular glass block, prism and lens. Effects of refraction. Use in camera, eye, spectacles, microscope, telescope and spectroscope.

B. Hygiene and Chemistry.

- I. Air and water and their uses. Composition of air. Oxygen and nitrogen. Preparation of oxygen. Formation of water when substances containing hydrogen are burned. Study of water from the chemical standpoint. Combustion. The burning of a candle, coal-gas and certain foodstuffs, such as bread, and the examination of the products of combustion with a lighted taper, litmus, solution of lime-water. Breathing. Comparison between breathing and burning. How air is pumped in and out of the lungs. Absorption of oxygen by blood in lungs, by blood in gills of fishes, by skin of frogs. The difference between inhaled and exhaled air. Carbon-dioxide in some detail. Ventilation, personal hygiene, correct habits of breathing.
- II. Foods and their uses. Body requires food for energy, repair and growth. Energy obtained by oxidation of

food materials. Simple food substances such as sugar, starch, proteid, fat and mineral substances, with single tests for each. Brief account of digestion and the parts played by mouth, pharynx, œsophagus, stomach, intestines, salivary glands, gastric glands, liver, pancreas and intestinal glands. Care of teeth.

III. Blood and its uses. Blood as a carrier of oxygen and food materials to all parts of the body. Blood as a receiver of waste products. Excretion of waste products by lungs, skin and kidneys. Examination of blood under a microscope. Red and white corpuscles. The circulatory system. Heart as a pump to produce circulation. Effects of exercise in fresh air. Effects of nutritious food.

IV. Clothing. Purpose. Comparison of the values of cotton, woollen and silk clothing. Tests for cotton, wool and silk. Exercise and warmth of the body. Pores and perspiration. Cleanliness of the body. Soap, its manufacture and uses. Best soaps for domestic purposes. Nature of laundry processes.

C. Magnetism and Electricity.

The syllabus is designed to give the scholars simple ideas about

- I. *Magnetism*.—Magnetic attraction and repulsion; terrestrial magnetism and the mariner's compass.
- II. *Frictional Electricity*.—Attraction and repulsion. Conduction and insulation. Thunder and lightning. Protection of buildings.
- III. *Current Electricity*.—Simple cells. The magnetic action of a current. Galvanometers and their uses. The electric bell. Telegraph, telephone. Resistance. Arrangement of resistances leading to heating effects and electric lamps (the electric equipment of the school to be studied). Arc lights. Chemical action of currents in electro-plating. The dynamo. Electric motors. Visit to Manchester Corporation Electrical Works.

P. SANDIFORD.

(Also A. BARTLE for Physiography.)

CHAPTER XIII.

MATHEMATICS.

I. FOUNDATIONS FOR MATHEMATICS UP TO THE AGE OF NINE (CLASS III.).

1. The Science of Arithmetic has developed in response to a need, and the necessity for measurement, to which its origin can be traced, has become more and more pressing as civilisation has advanced. The more civilised the race became, the more complex its life, and hence the increase in the use of measurement and in the variety of number concepts. Complexity of life and multiplicity of interests tended always to make a man's time more valuable; hence it became important when an object was to be attained that the way leading to it should be as clear and direct as possible.

Now from the beginning the use of number in real life has been as a means to an end and not as an end in itself. So with the growing complexity of human life the condensing process has been continuously applied to the use of number in order that time may be saved, and has resulted in the formation of the science of Arithmetic—the outcome of the experience of many generations of men and women. The same is true of ideas of space. The language of geometry which our scholars pick up at home and at school helps both to condense and define experience long before formal instruction in a syllabus can be proposed. All that the nursery and the school can attempt is to select material of geometric shape, which, among other immediate uses, supplies, also, opportunity for visual and tactile impressions. (The work of Madame Montessori (see Appendix II.) is the most recent evidence of what can be done in this direction, although Froebel was the pioneer.)

2. Arithmetic takes precedence of geometry, for—

(a) Need is felt for expressing the results of measurement, the child resorts to number because, by the age of six, he finds a purpose for it.

(b) This *purpose in use* being kept to the fore, the learner desires to solve his problem without delay, and hence finds satisfaction in abbreviating the processes and in omitting props, just as the race has done in its adoption of the decimal notation, etc.

(c) The increasing variety of practical interests, as well as of games, in the Transition and Classes I. and II. intensifies the need for mastering number, and presently an interest is *acquired in number for its own sake*.

(d) While this acquired interest is recognised and cultivated, reliance must still be placed on the relations of number to "life," *i.e.*, to the problems which the school pursuits as well as life out of school present; and this relationship is sought to be maintained right through the school.

Hence in the Transition Class grouping and counting are practised, and the written symbols are provided along with the other symbols of handwriting. But the most important experiences are still being gained, in handicrafts, games, etc., on the margin of attention, just as similar experiences have been gained by the little ones in the Kindergarten and the nursery. Contact with actual quantities constantly requires number and order, and the properties of the smaller numbers are thus realised without thinking about them.

3. With Classes I. and II. definite measurements are indispensable, as, *e.g.*, in the weaving. The decimal notation comes clear into the focus of attention, and a thorough understanding is here imperative, for many of the troubles experienced in later years (as, *e.g.*, in long division) are due to neglect at this age. In the same way practice with easy fractions can be enjoyed, although vulgar fractions as a separate study are postponed till Class V.

Games involving reckoning are greatly appreciated by children of six, if not earlier. From fear of making school too enjoyable teachers have not made enough of the possibilities, which the toyshops demonstrate, of gaining power from games like dominoes or bean bags to train in arithmetic. Professor Meriam has taken great pains (see reference p. 32) to arrange such games so as to secure a steady advance in

computation while securing the intensity of interest created by competition between sides.

Now that an acquired interest in number has been aroused, drill is cheerfully accepted and is continued throughout the school course (see Chapter XIII.). But up to Class III., at any rate, these exercises should seldom be committed to paper. Arithmetic must be "mental," *i.e.*, its operation should be mastered and become automatic independently of paper. Space will not permit here a discussion of the images by which children variously picture the digits, but it is quite certain that the artificial, written symbols of our notation are no substitute for the more logical relations between numbers which are the foundation of rational arithmetic.

In Class II. lively interest is found in building up the multiplication tables in a rational order of sequence (*e.g.*, ten times before seven times) and in counting in groups. This practice in the grouping of numbers makes it easy for the class in the following year to undertake the formal work of Class III.

II. SCHOOL MATHEMATICS UP TO FIFTEEN.

(CLASSES III. TO VIII.)

4. The Comprehensive title "Mathematics" is used to include the branches of Arithmetic—Theoretic and Practical, Geometry and Algebra; these are not, however, differentiated until Class VII. is reached. And although in Classes VII. and VIII. Arithmetic, Algebra, Geometry and, finally, Trigonometry are taken as separate studies, they are entered together in the timetable as one pursuit, and taught by the same teacher, so as to continue the intimate connection established in the earlier years before Algebra and Geometry emerged as independent modes of thought.

It is now the custom in the Junior Classes of many schools to give three or four periods a week to Arithmetic and one or two to so-called Practical Arithmetic, the two in some cases being taken by different teachers. The Practical Arithmetic then becomes a course of elementary mensuration, entirely separate from the arithmetic teaching. The title "Practical" Arithmetic should disappear; it belongs to the initial period of

reform in Mathematics teaching, when it was important to lay stress on the necessity for the scholars themselves to engage in the measurement of quantity.

The intimate relation between number and space makes it necessary to keep the two in close relation. For "Number is a product of the mind's action in the measurement of quantity—that is, in making a vague whole definite."¹ The term measurement is used here in its broad sense, denoting not linear measurement merely, but the process whereby quantities are defined in terms of some primary or derived unit. Such employment, called "practical," involving the use of instruments of various kinds, has been cut off from the more or less theoretical arithmetic arising out of the practical experience of the scholar. It has been regarded as a new kind of arithmetic, as something to be taken in addition to the older type of exercise, which consisted merely in learning how to operate with numerical symbols. By uniting theory and practice in one course we gain much.

An attempt is made in this syllabus to indicate the place which such practical work occupies in the acquirement of elementary mathematics. The mathematics of the young scholar must grow out of his individual experience. His interpretation of the world around him is partly a mathematical one, and his school mathematics must grow along this line, in response to the desire for conquest by measurement; every arithmetical operation must for the young scholar have its roots in experience. "In the beginning we must make constant reference to measured quantity," says Dewey. The teacher must draw for his material upon the scholars' everyday work in all possible directions. Take as one example the amount of mathematics involved in building the wall of a Norman keep. The wall is to be modelled with clay; it is to be so long, so high, and so thick. The separate bricks must therefore have a certain length, breadth and thickness, and they have to be made a certain shape. Now, all this involves geometrical ideas, measurement and calculation.

5. *The Arithmetic of Money*.—This so-called practical arithmetic has to some extent, and quite properly, dislodged from pride of place the older syllabus which found in money affairs

¹ McLellan and Dewey, *Psychology of Number*, chapter ii.

the only application for the notions of arithmetic. We do not need to occupy our scholars very largely with money matters; for, apart from school, they will learn as they need the current coinage and its use in common exchange. But the syllabus does not for this reason go to the extreme of excluding money entirely. For (a) the very fact that the coinage is so familiar makes it easy for children to practise in pounds, shillings and pence during periods when they are learning to be quick and accurate in computation; (b) in the two last years (Classes VII. and VIII.) the Humanities syllabus introduces them to the culture of the modern world, and they are ready to tackle problems of commerce, even though they have no first-hand acquaintance with profit and loss, shares or debts. And the simpler principles of bookkeeping, which will be illustrated by the accounts of the school camp and garden, come still closer to their experience, especially as a number of our scholars come from homes connected with retail trade. (c) Nor do we feel justified in confining the arithmetic of money to these two years. While we feel ourselves free to depart very largely from scholastic tradition, we are ready to make some concession to a feeling which is much to the fore in English homes. There is a superstitious value attached to "doing sums," meaning thereby money sums, and the pleasure children take in them, if not pressed to excess, seems genuine.

For these reasons we devote some time to such exercise in every class, although we are quite conscious that the commercial instinct requires no extra stimulus from the teacher.

6. *The Place of Algebra.*—The study of Elementary Algebra grows naturally out of the elementary arithmetic. The power to generalise and use symbols is only acquired by degrees. When a scholar passes from the stage where he realises that 4 things + 3 things = 7 things to a stage where $4 + 3 = 7$, he has taken a big step along the road to the algebraic generalisation $ma + na = (m + n)a$.

After having for some years expressed in words the results of exercises involving measurement our scholars can pass on to the expression of similar results in symbols. The right time to make this transition is when the scholars themselves, through the measurements on which they are engaged, find a need for

some mode of expressing in a more compendious form the arithmetical generalisations which they have reached. In response to this felt need the notation using the generally accepted symbols is supplied and an algebra is begun. Convenience alone dictates the use of the conventional symbols, and, but for this, there is no reason why children should not use a notation of their own. It will be found better, as a matter of fact, in the early stages for the scholars to use their own symbols, otherwise the symbols themselves are taken to have an intrinsic value; e.g., every unknown quantity is x , and never by any chance a , b , or c .

We wish to make it clear that although Algebra as a school study appears in the syllabus for the first time in Class VI., the use of letters to represent a quantity should be attempted just as soon as the teacher finds the scholars ready for it. The wrong way is to teach an arithmetic in the early years which is rigidly confined to the decimal notation, and then commence an algebra as an entirely fresh pursuit. By the time the scholars are well on in Class VI. they have become sufficiently acquainted with the use of symbols, especially in the equation, and their Algebra can then be made more definite, for an acquired interest is discovered in the symbols themselves. Problems are set which involve the necessity to perform the operations of addition and subtraction with the symbolic notation, and the scholars proceed to formulate the laws of addition, etc., which were assumed when arithmetic was begun; for example, the law of commutation was assumed by the little child whenever a column of figures was added, the digits being taken in various order for the purpose of making up tens. The law is now displayed in its general form, and the arithmetical process is discerned in a larger setting. So the work proceeds as shown in the syllabus, the necessity for each new operation arising out of the desire to solve some problem. Such problems should arise from topics within the scholars' experience; they will bear upon geometrical problems or be found in connection with the science work, or with any of the experiences in the scholar's daily life, which the class as a whole can appreciate.

7. *Graphical work* has been introduced at a very early stage, not as something patched on to the mathematics, but rather to

be woven into the fabric. It provides a new tool on which the young mathematician before he leaves school should be willing to rely, and its use can first be discerned in Class VI., where data are gained experimentally in the Science course. But the scholar usually experiences difficulties which teachers are liable to ignore, and in consequence many of them never get to be happy in using the tool. The strangeness of the idea of representing by linear measurement a quantity which has no concern with line ought to have been overcome in earlier years. Time charts (see p. 84) involve the same idea, and with more exactitude the temperature charts (see p. 187). In these last the scholar gets used to applying his ideas of scale and ratio to the axes of a chart; but he can easily be led to note that the points obtained on the chart are merely isolated points, and do not teach him any rule by which the temperature reading of one day is related to that of the preceding or succeeding day. When the time has come, in Class VI., to approach the idea of function, we make the first step easy by taking a problem from the Science scheme, which readily lends itself to pictorial illustration, as for example the change in volume of water with change in temperature (see p. 190). Their attention is now directed to some of the pictorial illustrations of successive increase, such as are frequently provided in magazines, especially since the Tariff Reform agitation has aroused popular interest in figures, *e.g.*, a series of mannikins increasing in size with every decade, according to the increase of Germany's population contrasted, say, with France, since 1850—two curved lines result. Scholars will readily make up one or two sketches of the kind for themselves and should be allowed to do so freely and have time for it. After this they are ready to represent facts from the science, "plotting" curves for Boyle's Law, etc. Finally—and this step needs quite separate study—a situation appears where the ratios are constant and "the graph" appears as a straight line. This is a new feature which strikes their attention, and they can be switched off to the pure mathematics, picturing successive proportions by means of rectangular co-ordinates, using algebraic symbols.

We have dwelt a little on this section because it so often proves a stumbling-block. Success depends upon (1) making

constant use of graphical representation to aid the Science syllabus (including Physiography), (2) differentiating the steps by which the scholar gains mastery of this tool, from the time chart up to a mathematical graph properly so-called, with the conception of function clearly apprehended.

8. *Relation of Geometry to Arithmetic and Algebra.*—The place of Geometry is discussed in Chapter XV. From the second column of the syllabus below it will be also seen that the geometrical concepts come to the fore in conjunction with arithmetical problems. Number and space are thus closely related, and we regard the practical geometry (or mensuration) as an essential part of the course. For example, in Class V., the scholars need to draw a square; to this end they must apperceive its properties with exactness, although we do not demand a formal definition. This last is only felt to be necessary in the theoretic course (see Chapter XV.). Thus, no necessity arises for introducing a separate course of practical geometry, as mathematicians have so often recommended. The technical terms (see Chapter XV.) are more and more carefully used from Class II. onwards. Their meaning becomes narrowed, until in Class VII. the scholar is ready for a precise scheme both of thought and of expression.

9. The following scheme of study for Classes III. to VII. is arranged in three columns. The first column gives the progress of ideas relating to number; the second indicates various exercises in measurement. Some of these are concerned with geometrical ideas, and hence this column shews the progress made in practical geometry up to Class VI. The third column goes outside the course of Mathematics and indicates pursuits which engage the class at other periods of the day. These, however, require the aid of mathematics, and hence it is important that the relations should be noted, so that the teachers can co-operate.

In the final year, Class VIII., the division into three columns is dropped, for the value of the study has by this time been adequately established as a tool for the enlargement of experience; and herewith an acquired interest in Mathematics has been developed. Hence neither practical work nor correlation need separate mention, and we cover as much ground as

possible, bearing in mind the special function of this last year of school-life (see p. 33).

One important difference should be noted between this and the syllabuses in Science or the Humanities. In those branches each year provides a new theme, which *can* be taken up with success, although the studies of earlier years had not been completed or adequately appreciated. But the contrary is the case in Mathematics, and this accounts for the perpetual revision which troubles the teacher of Mathematics far more than his colleagues. Hence, while we divide the entire course into six "years," we anticipate that any given class may not always complete the portion assigned to that year; in that event they must, at the beginning of the next year, proceed in September at the point where they left off in July. For example, if constant ratio has not been mastered in Class VI. it must be dealt with in Class VII. before commencing the applications of percentage and proportion in Interest, Profit and Loss, etc.

NOTE.—Acknowledgment should be made of the help of Miss M. E. Fountain, B.Sc., formerly lecturer in the Department of Education, in the preparation of earlier drafts of this chapter.

OUTLINE OF SYLLABUS. KIND OF PRACTICAL WORK INVOLVED. CORRELATIONS.

CLASS III.

Simple Addition and Subtraction. Multiplication by numbers up to 12. Construction of Tables; written down, learned by heart and practised in games, etc. Division by numbers up to 12.

Division by factors. Simple English Weights and Measures and the four rules with money are included. (Throughout the syllabus the work will consist of (a) the solution of problems, (b) working written and oral examples to acquire dexterity in computation.)

Use of objects in learning to count. Objects to represent *groups* of ten. Division of objects into groups. Practical experience with weights and measures involved in making tables and solving problems. Estimation of lengths. Measurements with tape measure and ruler.

Measurements in connection with Geography and Humanities: the making of plans and models, etc. (See Science and Craft schemes.)

OUTLINE OF SYLLABUS.

CLASS IV.

The Metric Measures of Length.—The Decimal Point introduced as a contracted method of expressing the different fractions of the metre, etc. Average measurements. Inches and tenths expressed with decimal notation. Simple decimalisation of money, leading to the generalisation of decimal notation as expressing tenths.

Compound Multiplication. Long Division (including money). Factors (arising from observations on tables). Tests for 2, 5, 4, 3 and later for 9 and 11).

Applications of the four rules.—Tests will include Bills (from the office, shops, etc.) and Practice Methods. Problems.

KIND OF PRACTICAL WORK INVOLVED.

Estimation and measurement of length. Measurement of curved lines, including the elementary Geometry of the "line"—straight and curved lines, thick and thin lines. Sighting to get long distances measured. The meaning of approximation will arise in the course of measurement; similarly the use of "an average." The cube, prism and cylinder will be introduced in the measurement of perimeters. (Flat and curved surfaces.) Division of straight lines by different methods, involving the use of compasses, set-squares, etc. Making of hand sketches and of more accurate drawings. Simple plans, scale $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{8}$. Solution of practical problems arising in connection with craft-work.

CORRELATIONS.

Craft-work, e.g., Mathematics involved in construction of models in connection with the Humanities and Natural Science (see pp. 97 and 187).

CLASS V. OUTLINE OF SYLLABUS.

Vulgar Fractions (introduced through scale drawing).—(a) Equivalent Fractions. (b) Addition and Subtraction. (L.C.M. introduced.) (c) Multiplication and Division. Interchange of Vulgar and Decimal Fractions. (The term percentage will be introduced as a name for fractions which have 100 for denominator; $\frac{3}{100}$ of anything is called 3 per cent.) Simple percentage problems (e.g., to find "percentage of," etc.). Problems involving fractions.

Decimalisation of money and reverse process. Multiplication and Division of Decimals. (Cf. areas in practical work.) *Applications of the Four Rules*.—More difficult examples in Bills and Practice methods; some examples better worked by decimalising (involving simple approximation). Reduction, i.e., changing.

KIND OF PRACTICAL WORK INVOLVED.

The practical work leading to the formulation of the rules for the operation of fractions, commencing with the known divisions of the foot, metre, pound, etc. This will include division of straight lines and areas (rectangle, circle). To find what fraction the radius of a circle is of the circumference and generalisation in a formula.

Angles (probably arising from the study of triangular figures).—Arms of angle; copying angles; standard angle. Simple protractor made; use of ordinary protractor. Measurement of height by use of angle; construction of various triangles; triangles made like other triangles; similar triangles.

Area of square, rectangle, parallelogram (construction of parallel lines). Formulæ for areas. (Note use of a^2 , c^2 . Use of 2^3 , 3^4 , etc., in factors.) Table of Square Measure, including 40 poles = 1 rood, 4 roods = 1 acre.) Graphical work. First example (of pictorial kind) from science. Graphical representation extended to problems on man walking, stone falling, etc. Term "varies" used and "variation with." Graph of variation of area of square with increase in the side.

CORRELATIONS.

Craft-work. Scale drawing and work involving fractions during the construction of the globe.

Physiography. Cardinal points. Mariner's Compass.

Craft.—Construction of simple theodolite for this purpose.

Science.—River water: Graph of variation of impurity with increase of distance from source.

OUTLINE OF SYLLABUS.

CLASS VI.

Further work on multiplication and division of decimals and decimalisation of money. Simple approximation. Square root. Volume table, *i.e.*, cube measure.

Ratio.—Fractional notation used to express ratio. The rules for fractions applied to Ratio.

Constant Ratio (introducing term "Proportional to"). Equal ratios, *i.e.*, Proportion. (Further examples in Percentage.) The terms "Proportional to," "In proportion," "Inversely proportional to" made quite familiar from many examples in practical work and from Science. Numbers in proportion.

Generalised Arithmetic.—The scholars are now familiar with the "equation," as a method for the representation of some relationships, *e.g.*, $c = 2\pi r$, $A \pm b \times h$, etc. They have had practice in substituting values in these equations, *e.g.*, given r , find c ; given c , find r . Problems will now be set which can most easily be solved by the use of the equation, and

KIND OF PRACTICAL WORK INVOLVED.

Arithmetical examples on area; paper-walls, etc. Elementary surveying (*a*) by chain method, (*b*) by plane table. The Metric Weights.

Finding ratio of areas of given figures (*e.g.*, similar triangles). Ratios of volumes; variation of area and volume with side and base. Graphic representation of this variation.

Constant ratios, *e.g.*:—Ratio of altitude to side of equilateral triangle: diagonal to side of square: circumference to radius: Interest to Principal, etc. Graphical representation of quantities in proportion.

CORRELATIONS.

Science.—Methods worked out for finding the area of the triangle and the circle. The Metric Weights: Area by weighing.

Craft.—Making of simple plane table and sighting rule.

Science.—Volumes of cube and square prism, cylinder, sphere by measurement, weight and measuring glass. This provides much work in arithmetical working-out of volumes, examples in ratio and symbolical expression.

Loss in weight: Ratio of volumes equals the ratio of loss in weight, *i.e.*, loss is proportional to volume. Density: Ratios of weights of 1 cc. of different substances.

OUTLINE OF SYLLABUS.

KIND OF PRACTICAL WORK INVOLVED.

CORRELATIONS.

CLASS VI. (*Continued*).

these problems will be chosen so as to lead to the introduction of simple addition and subtraction, using symbols as a generalisation of arithmetical rules. The problems will involve the use of brackets and the laws of signs will be worked out. The negative sign will be applied to numbers in problems dealing with direction, worked graphically. The quantities will also be expressed in algebraical terms and provide exercise in addition and subtraction of literal quantities. Further examples in substitution in formulæ will be given.

Other problems will introduce simple fractions with numerical denominators, and problems in connection with area will introduce multiplication. (Indices should be familiar from the work on factors in arithmetic.) Multiplication will introduce factors.

- compared with that of
"water." Balancing columns
as an example of inverse
proportion. (Graphical
representation.)

CORRELATIONS.

KIND OF PRACTICAL WORK INVOLVED.

OUTLINE OF SYLLABUS.

CLASS VII.

Arithmétique.

Proportion continued; further examples from Science work on levers, etc. Inverse proportion, examples from Science.

Applications of percentages and proportion in Interest, Profit and Loss, Banker's Discount.

Approximation. [The scholars have been familiar with the meanings and use of approximation right through the course; the degree of accuracy to which arithmetical operations can be carried is now gone into in more detail.] Multiplication and division of decimals, meaning of significant figures, limits of error taken and applied in problems. (Compound Interest for a few years forms a simple application.)

Algebra.

Problems leading to quadratics. Solution by graphs; solution by factors; factors taken in more detail for this purpose; solution by completing the square. Square roots at sight. Compound multiplication arising from factors. Problems introducing fractions with literal denominators. Addition, subtraction, multiplication and division of simple fractions.

Geometry (see Chapter XV.).

Science. — Examples taken from levers, pulleys, wheel and axle, etc. Boyle's Law, $PV = \text{constant}$.

Graphical representation of Interest as a function of the Principal. Amount as a function of the Time (rate and principal remaining constant).

Science. — Graph of $C = \frac{1}{F} (F - 32)$.

Further graphical work: the general case of a linear function; solution of quadratics by graphs.

CLASS VIII.

Arithmetic.

Continuation of Class VII work. Shares and Stocks. Money Market (foreign money, if not already taken). Elementary book-keeping, using the Garden and Camp accounts. Arithmetic in connection with the School Office work.

Indices and Logarithms. Logarithms used in future where the required degree of accuracy will allow. Elementary use of the slide rule.

Algebra.

Continuation of the work in Class VII, with more difficult examples and problems.

Simultaneous equations with two unknowns solved graphically and algebraically.

Generalisation of arithmetical rules of ratio and proportion for the purpose of Geometrical application.

Geometry (see Chapter XV.).

Elementary Trigonometry.

Study of sine, cosine, tangent, and the graphs of these. Solution of the Right Angle Triangle. Application of this to measurement of heights and distances, using a simple theodolite. Solution of other triangles, and the application to elementary surveying; use of the Plane Table.

TEXT-BOOKS.

All we require by way of text-books are inexpensive books of examples for practice, to save teachers and scholars time in copying.

BOOKS OF REFERENCE.

A. For the Psychology of the Subject and for General Method.

The Psychology of Number, McLellan and Dewey (International Education Series); *The Teaching of Elementary Mathematics*, Smith; *A Study of Mathematical Education*, Benchara Branford; *A History of Elementary Mathematics*, Cajori.

B. For Special Method.

Practical Arithmetic, Consterdine and Andrew; *The Algebra Syllabus in the Secondary School*, Godfrey, B. of E. *Special Reports on Educational Subjects* (Wyman & Sons).

Suggestions for the Teaching of Arithmetic, B. of E. *Circular*, 807.

A. S. HARRISON.

CHAPTER XIV.

NOTES ON METHOD IN THE TEACHING OF ARITHMETIC.

We offer first some general notes applying to the entire course and then treat the separate topics presented in the syllabus of each class.

It is important in the actual work of computation that the same methods for the fundamental operations of addition, subtraction, multiplication and division should be learned throughout the school. It is for this reason that detailed examples are given in the following notes.

The arrangements for setting down arithmetical work are directed to produce results with a maximum of speed and accuracy. Our choice from among various possible arrangements is governed by these two requirements; they are largely identical, for there is less opportunity for error when fewer figures have to be set down.

In the Introduction to the Syllabus the vital connection between the practical work and the arithmetical rules has already been emphasised, and in the following notes this has been illustrated in some detail in connection with the teaching of vulgar fractions. But the principle is the same in all the work—the need for a rule should arise from experience and the rule should be formulated as a result of experiment and observation. As the scholar gets older he will give more and more attention to the processes of reasoning in making these formulations.¹

The figuring (*i.e.*, the written figures) should go alongside of the experimental work and the scholars trained to make observations on the results. Some of the experiments are done for the explicit purpose of trying to find out how to perform an operation; at other times the scholar's main interest is in the

¹Teachers should read in this connection Benchara Branford: "*A Study of Mathematical Education*," chapters vi. and xvii.

piece of practical work itself. But the teacher should always have clear in his mind the goal towards which the work is leading; his is the guiding mind which helps the scholar to pass from experimental evidence to the general "truth." It is often necessary to refer back to the concrete after the formulation has been made: some scholars are much slower than others, and if the formulation has been thrust upon them before they are ready for it then no amount of "arguing" on the abstract process will be of the slightest avail; the scholars in this case should go back and perform the process in the concrete. For example, if the method of computing remainders in a division by factors is not understood the scholar should divide books, pencils, beans, etc., into groups and do the corresponding figuring after each division has been made (see p. 224). The teacher will find useful suggestions in connection with this experimental work in Consterdine & Andrew's *Practical Arithmetic* although the actual models are not necessary (see Chapter XV.): such a book is not, however, recommended as a scholar's text-book, for he is told what to look for and the formulations are given to him. (This criticism is much the same as that directed against the usual geometry text-book (see Chapter XV).)

The applications of the rules should always include a large number of simple problems. Scholars are apt to find difficulty in seeing what arithmetical principles are involved in a written statement of certain facts; hence solutions should be written out clearly, *i.e.*, the sentences, although written in arithmetical *shorthand*, must be logically connected. The problems should not be grouped together (each group having a method of solution peculiar to itself), but should be sufficiently varied to demand from the scholar an intelligent examination as to method in each case. It will then be unusual to hear "I have not done that kind" as an excuse for not attempting a solution. It is not facility in solving certain types of problems, but an attitude of mind, a mode of attack, which we wish to develop.

A word may here be said on the question of setting down the work in general. When the scholars are doing written work involving operations to which they are not accustomed, the focus of their attention is on the process and not on the figuring; at this stage it is folly to demand very careful and

neat work. Our scholars' exercise-books often show very clearly the variation in neatness due to the alternation of new work with exercises with which they are familiar. The time to discuss with them the best methods of setting down the work is when the scholars are familiar with the processes. They should be allowed to write on the blackboard the arrangement which they think best. When their own methods are contrasted with other arrangements and criticised by teacher and classmates the scholars will soon be convinced that a certain method is better than others. In the same way short cuts in working and abbreviated methods of notation should not be introduced till a majority of the class are ready for them. If the teacher refrains from forcing on the scholars generalisations and abbreviations, and waits to see what the scholars evolve, he will be interested to notice how often the scholars' work passes through stages similar to those we read of in the history of mathematical progress. We find indices "muddled" because the boy has been prevented from writing "a a a a" when he would have done so had not " a^5 " been given to him. (See *A Study of Mathematical Education*, p. 257 and elsewhere; also reference on p. 193.)

One further point with regard to the setting down. Scrap paper and marginal work are forbidden; work which cannot be done "mentally" must appear on the paper as a part of the orderly solution of the problem.

Constant reference is made throughout the course to approximation. Very early on the scholars become acquainted with the fact that approximation is involved in all measurement. This should influence their work in the solution of problems, and they should critically examine to what degree of accuracy the answer may be determined. Methods of shortening the work by keeping within the limits of accuracy determined by the data can be early introduced when decimal notation is used.

The scholars should be trained to make an approximate estimate of the numerical size of the answers to problems. If this is done, it is an exceptional occurrence for an answer to be given which is many times too large or too small.

The necessity for drill work, in the lower classes especially, should not be lost sight of in our anxiety to teach by rational methods. Thus, when a multiplication table is constructed it should be learned and learned thoroughly. To give dexterity in computation, practice in handling number should follow the work based on definite magnitudes, and "sharp practice" in mental arithmetic should also form part of the work in junior classes. The time for the bulk of this mechanical work is while the scholars are in the lower classes and the emulative instincts, as the Jesuits long ago taught us, can quite properly be resorted to, as an incentive to improvement in accuracy and quickness. Just as at an earlier period games with dominoes and bean-bags form the best introduction to *ideas* of number, so at this period these competitive and self-assertive instincts enable the boy and girl to secure a mastery of the number-machine as a mechanical tool.

A weekly revision test on back work is set in all the classes, and if a rule is found to be rusty a little practice is given for about ten minutes at the commencement of each lesson during the next week. This method of revision is also found useful when a new rule has been learned. As soon as the lesson period arrives some scholar, without waiting for the teacher to enter the classroom, puts a few examples on the blackboard for the class to solve, *e.g.*, the scholars may have been learning how to decimalise money; at the commencement of the lesson a scholar writes three or four examples on the board, which are worked by the class.

It is seen from the syllabus that a topic is not ~~treated~~ exhaustively before a fresh one is introduced. A period of intensive study may be taken in order to get the fundamental principles clear, but further developments and more difficult applications are taken later. For example, decimal fractions are introduced in Class IV., but with very simple applications only. After the scholars are familiar with this method of representing tenths, etc., and can use the decimal point in simple calculations, they pass on to the further study of vulgar fractions, but to the end of their last year in school they constantly extend their knowledge and understanding of the decimal notation. Opportunities often occur for extending the

meaning of arithmetical processes already learned when the questions set in the weekly test are worked through in class, and this use for the test, especially in the upper classes, should not be neglected.

Class III.—*Addition*—The scholars are taught, to add by making up tens, *e.g.*, $7+8=(7+3)+5=10+5$. Later, this step is missing in the mental work, and the scholar "says" $7+8=15$ at once, because he is familiar with the result. It shortens the work to be able to pick out tens quickly, provided numbers making the ten are near together in the column or line.

To add 9, add 10 and take away 1 (practice should be given, *e.g.*, 14, 23, 32, 41, 50, etc.). Example in addition:—

$$\begin{array}{r} 6 \\ 7 \\ 3 \\ 5 \\ 2 \\ 1 \\ 8 \\ 6 \\ 4 \\ \hline 42 \end{array}$$

For a time the scholars find it a help to mark the tens as shown. The order in which the numbers are added is clear from the following:—

10, 20, 21, 26, 36, 42.

In adding money the farthings column is added by making up pence; the pence column, by making up shillings; the shillings column, by making up pounds (though some find it quicker to add this column in tens). This is quicker than adding in tens and then dividing by 4, 12, and 20, *e.g.*:—

$$\begin{array}{r} 16 \quad 4\frac{1}{4} \\ 10 \quad 8 \\ 8 \quad 9\frac{3}{4} \\ 7 \quad 6 \\ 13 \quad 10\frac{1}{4} \\ 8 \quad 6\frac{1}{2} \\ \hline \pounds 3 \quad 5 \quad 9 \end{array}$$

The following are the steps in the process of the addition:—

1d., 2d., carry 2.

1s., 2s., 2s. 9d., 3s. 9d., carry 3.

11s., £1. 11s., £1. 19s., £2. 19s., £3. 5s.

Another plan for the steps might be:—

1d., 2d., carry 2.

1s. (10 + 2), 2s. (with 6 + 6), 3s. (with 8 + 4), 3s. 9d., carry 3.

11s. (8 + 3), 21s. (with 7 + 3), 35s. (with 8 + 2 + 4), 65s. (with the three tens) = £3. 5s.

[There may be varieties in these short cuts, but every scholar should be shewn how such helps can be used, while he is plastic enough to be able to adapt his counting to a good shortening system.]

Subtraction.—This is treated as complementary addition, being first introduced by problems which enquire: "What must be added to 8 things to make 15 things?" etc. (the making up of tens is again used: 8 "and what" to make 15? $8 + 2 = 10$, add $5 = 15$. $8 + 7 = 15$); and problems which involve a missing line in an addition sum, e.g.:—A boy sows 137 beans in five rows—26 in the first row, 27 in the second, 25 in the third, and 28 in the fourth. How many does he sow in the fifth row?

26
27
25
28

**—31 beans, Answer.

137

The first column adds up to 26. We then ask—"26 and what to make a number with 7 in the units place?"

26 and 1 = 27, carry 2. 10 and 3 = 13.

The method of complementary addition is used with a view to the "Italian" method of long division later. In money sums the same method is used as in the addition.

£2 8 3½
15 6½
£1 12 8½

$\frac{3}{4}$ d. and $\frac{3}{4}$ d. = $1\frac{1}{2}$ d., carry 1d.

7d. and 5d. = 1s., 7d. and 8d. = 1s. 3d., carry 1s.

16 and 4 = 20, 16s. and 12s. = £1. 8s., carry 1. 1 and 1 = 2.

Tables.—The tables are constructed by counting in groups, e.g., four times by counting in groups of four. They should be learned in the usual form, viz.:—

$$\begin{aligned} 3 \times 5 &= 15 \\ 3 \times 6 &= 18, \text{ etc.,} \end{aligned}$$

and also in the form—

$$\begin{aligned} 5 \times 3 &= 15 \\ 6 \times 3 &= 18, \text{ etc.,} \end{aligned}$$

in order to make thoroughly familiar the two ways of regarding the factors and product, e.g.:—

15 inches = 5 groups each of three inches.

or 3 groups each of five inches.¹

The tables of weights and measures are learned as they are required, e.g., the Metric Weights in Class V., when the amounts of impurity in samples of river water are compared. At first only those weights and measures are taken which are necessary for the solution of such problems as may be set. There is no necessity, for example, to study the whole of the square measure table because square inches and square feet are introduced. The table is added to as need arises, and the scholars ought to have a good idea of the magnitude of the measurements they are dealing with. Scholars cannot be expected to make a rational enquiry into a problem if the units of measurement used are merely so many words to them. The writer recently watched a group of scholars solving a problem in which the term "acres" occurred. The variation in the solutions offered suggested the enquiry: "What is the area in acres of the school grounds?" The estimates varied from $\frac{1}{2}$ acre to 200 acres—the actual area is $2\frac{1}{2}$ acres.

Short Division.—The two ways of regarding the factors of a product, mentioned above, apply in division as in multiplication. The quotient may be a "number of times" or a "concrete quantity," and the remainder should be presented as something separate from the quotient, e.g.: Divide 88 pence equally among

¹ See McLellan and Dewey: *Psychology of Number*, pp. 72-78 and chap. vij.

three boys. 88 pence equals three groups each of 29 pence and 1d. over:—

$$\begin{array}{r} \text{d.} \\ 3 \overline{) 88} \\ \underline{29} \text{d. each and 1d. left.} \end{array}$$

How many threepences in 88 pence? 88 pence equals 29 groups each of 3d., and 1d. over.

$$\begin{array}{r} \text{d.} \\ 3 \overline{) 88} \\ \underline{29} \text{ groups + 1d.} \end{array}$$

Objects are divided into groups and the "figuring" corresponding to the practical processes is done immediately after, so that the two are connected. For example, when the scholars are beginning to divide by factors we present a problem such as the following:—

If we have 112 books to divide among the classes of the school, giving 5 to each class, how many classes can be supplied, and will any books be left over? Someone will quickly suggest that it is best to count out fives first and then put three fives together. The 112 books are actually divided into piles of five and then the arithmetical work is done on the board:—

$$\begin{array}{r} 5 \overline{) 112} \\ \underline{22} \text{ piles + 2 books.} \end{array}$$

The 22 piles are now grouped in threes. One pile is left, and this is a pile of 5 books, so the remainder is not 1, but 5:—

$$\begin{array}{r} 5 \overline{) 112} \\ 3 \overline{) \begin{array}{l} 22 + 2 \text{ books} \\ 7 + 5 \text{ books} \end{array}} \end{array} \left\{ \begin{array}{l} 22 \text{ groups of 5, + 2 books} \\ 7 \text{ " } 15, + 1 \text{ group of 5 books} \end{array} \right.$$

Answer.—7 classes can be supplied and 7 books are left over.

Class IV. Metric System and Decimals.—Additional interest will be given to the introduction of the Metric System in Class IV. since the scholars are just beginning to learn the language spoken by the French people. Metric scales are provided; the length of the metre is compared with that of the yard; distances are estimated in metres and measured in metres roughly by striding or by using knotted string or the metre rule. More accurate measurements necessitate the introduction of deci-

metres, centimetres, and for shorter distances millimetres. A large number of measurements are made, and measurements involved in the craft-work are used for this purpose. The same measurements will be expressed in different ways, *e.g.*, 23 decimetres = 2 m. 3 d.m., etc. The scholars' rules are marked in cms. and mms. in addition to inches.

The decimal point is introduced as a short way of distinguishing mms. and cms. At the same time stress is laid on the fact that mms. are tenths of cms. The writing of dms. and cms. in terms of the metre introduces two places of decimals, and finally mms. will give three places as representing tenths, hundredths and thousandths of a metre. (It is interesting to note that many children suggest writing 3 dm. 4 cm. 8 mm. as 3.48 dm.)¹ Practical problems which require the addition of a series of lengths, or the difference of two lengths, or the division or multiplication of a length introduce the decimal point into simple calculations, for these are done after the practical work. For example, the scholars are required to find a fourth of 1.36 dms., a line 1.36 dms. long is drawn and divided into two equal parts (with dividers or compasses on the usual method for the bisection of a line) and one of the parts bisected again. The division is now done arithmetically in the two stages, reference being made at each step to the line. Since the divisions are taken in connection with concrete quantities the question of remainders is quite simple, *e.g.*, required to find the sixth part of 1.37 m.

$$\begin{array}{r} 6 \overline{) 1.37 \text{ m.}} \\ \underline{.22 \text{ m.}} \end{array}$$

Here we have a remainder of 5; it is clearly 5 centimetres, and these can be divided again by calling them 50 mm. (we may here add 0 at the end of 1.37): 6 into 50 goes 8 times and 2 mm. left over.

$$\begin{array}{r} 6 \overline{) 1.37 \text{ m.}} \\ \underline{.228 \text{ m.} + 2 \text{ mm.}} \end{array}$$

The more intelligent scholars will suggest calling these 2 mms. 20 tenths of a mm., but the sixth of this is less than half a mm., and so we do not take the division any further,

¹ See Cajori. *History of Mathematics*, p. 153.

hence we get 228 m. to the nearest mm. Quite young children easily understand such examples as these, and the foundation is here laid for rational solutions later. Thus, when the problem of how far to take the division is referred to the nature of the data and the remainder we shall not receive such answers as 3.6378 cms. as a possible length for the side of a triangle. As soon as scholars feel familiar with the notation they will attempt arithmetical solutions rather than those by measurement.

Multiplication and division by 10 are early introduced for the purpose of "changing," e.g., dms. to cms., and this is shown by the movement of the decimal point. Later on this will be generalised in some such form as:—The movement of the point one place to the right make hundredths into tenths, etc., i.e., we are multiplying by ten.

The next step is to use the decimal point to denote tenths of inches and later tenths of £1; and so finally generalised as denoting tenths of anything and finally "tenths."

The practical work involved in this measurement and estimation of lengths is sure to bring out the meaning of an approximation, viz., a *rough* measurement. For example, it is not necessary, or easily possible, to measure the length of a room to the nearest mm.; it is therefore measured to the nearest cm.

In the same way an average measurement can be introduced when scholars measure the same object and get different results; when this happens they often suggest that the best answer would be a number in between the two (a "medium" number), to find which "add them and halve the result." The word "average" is given, and scholars quickly refer to cricket averages; the average height and weight of the class can be found.

Such problems may quite well lead to the necessity for knowing how to divide by numbers which are greater than 12 and will not factorize. This is "long division" and the scholars see a definite purpose in learning a long division method. They may have already learned the long multiplication method, which we describe in the next paragraph, if occasion has arisen either in craft work or practical mathematics.

Traditionally, work in multiplication is expected to precede work in division, but this logical order only concerns the early stages of the Four Rules. The two processes here described for "Long" Multiplication and "Long" Division have little connection and can be learned at any time in this year which is found convenient.

The Italian method is learned straight away:—

$$\begin{array}{r} 48.5 \text{ inches.} \quad \text{Answer.} \\ 23 \overline{) 1116.3 \text{ inches}} \\ \underline{196} \\ 12.3 \\ \underline{.8} \text{ inches.} \end{array}$$

(NOTE.—The answer is written above the dividend in order to get correct place value when decimals are used; this plan also saves space.)

The working is as follows:—2 is used as a testing figure (had the divisor been 29 then the testing figure would have been 3), 23 may go five times or four times; 5 is quickly calculated to be too much because of the carrying figure. $4 \times 3 = 12$, 12 and 9 = 21, carry 2; $4 \times 2 = 8$, 8 and 2 = 10, 10 and 1 = 11, etc.

The same method is used in division of money.

Long Multiplication.—In multiplication the figure of highest place value is used as the first multiplier, this with a view to approximate multiplication later, e.g.—

$$3678 \times 83$$

$$\begin{array}{r} 294240 \\ 11034 \\ \hline \end{array}$$

$$305274$$

Most likely the 0 before the 4 will be used for a time, but it will be found in due course to be unnecessary; for we agree that units in the product are to be written under units in the multiplicand, etc.

In multiplication of money by numbers greater than 12 the most useful rule for numbers which will not factorise is to choose 12 for one multiplier and for numbers which do factorise to use 12 as a factor if possible; and this will soon be discovered by the scholars. This at once changes farthings to threepences and pence to shillings, e.g., 37 is taken as $(12 \times 3) + 1$.

Factors.—The scholars have been familiar with factors from the time they commenced to construct their multiplication tables, although the name may not have been used. For Class V. onwards it becomes more and more useful in arithmetical work to be able to resolve quickly a number into its factors and tell when a number is prime, *e.g.*, in finding the L.C.M. of a series of denominators and in all operations where "cancelling" may facilitate the solution.

Tests for factors are first definitely developed in Class IV. from observations on the multiplication tables. Scholars develop an "acquired interest" in the series of numbers presented in the tables and are ready from observation to find a test to tell when a number is in a certain table. For example, to test if a number is divisible by 3. Many observations are made, *e.g.*, the sequence of numbers in the units place; the succession of 3 ones, 3 twos, 4 threes, etc., in the tens place (some scholars are keen to puzzle out and offer correct explanations of these things). Each observation is examined as to its value as a test for the factor 3, and it is not long before the fact that the sum of the digits is divisible by 3 is discovered. Tests for 2, 3, 5, 10 are found (4, 9, 11 being left till later on). Scholars should frequently have practice in resolving numbers into their prime factors, an exercise which will be found helpful in giving mechanical dexterity in dividing as well as in factorising. Problems such as "How many divisors must we test a number with before concluding that it is prime?" will be discussed as they arise.

Class V. *Fractions.*—There is nothing new to the scholar in the idea involved in the process of fractioning,¹ but the operations of addition, subtraction, etc., using the fractional notation require separate formal study.

The early work in each of the processes is taken in connection with definite measured quantities with which the scholars are familiar, *e.g.*, length, area, weight, etc.

(a) The *Method of Notation* is first made clear, commencing with fractions which the scholars have been accustomed to

¹ *Psychology of Number*, chap. vii.

represent with the usual notation, *e.g.*, $\frac{1}{2}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ d., etc. The meaning of each of the figures in the fraction should be made definite, *e.g.*, in $\frac{3}{4}$ in. the 4 shows that we are dealing with fourths of an inch, *i.e.*, the length obtained by dividing an inch into 4 equal parts; the 3 denotes that in the length we are measuring there are three of these quarter inches. Other examples are taken and the scholars given practice in measuring in quarter inches, tenths of an inch, etc., and in expressing the measurement in fractional notation. The name "fraction" is given to numbers of this kind, but no attempt is made to formally define "fraction." [This is usually done by saying a fraction is *part* of a whole, but how is the scholar to interpret $\frac{1}{8}$ inch, where the whole referred to is the inch?] The scholars should have a clear understanding of "fraction" and be able to state in their own words the fact that the lower figure (named denominator) tells the number of equal parts into which a certain unit has been divided for the purpose of making a fresh measuring unit; and that the figure above the line (the numerator) tells the number of these parts in the whole which is being measured. [The further interpretation of the fraction as expressing ratio is reserved till later, see p. 238.] Numerous exercises are given on finding given fractions in connection with length, weight and area (rectangles, squares, using squared paper and by folding and cutting up). The scholars should always write down the fraction they have measured, and if they are encouraged to be on the "look-out" they will discover many things for themselves. They will gradually reach the generalisation that a fraction has two interpretations (although they cannot express this in words), *e.g.*, $\frac{3}{4}$ in. is $\frac{3}{4}$ of 1 inch, and $\frac{3}{8}$ of 2 inches. (*Cf.* the two ways of regarding factors and product, p. 223.)

(b) *The Equivalence of Fractions.*—The equivalence of fractions is their most important property, and unless this is thoroughly understood, from knowledge gained in the first instance by practical experience, the operations of addition and subtraction are mere mechanical juggling.

The teacher purposely gives problems which lead to the study of the equivalence of fractions. For example, the scholars are asked to draw a line $\frac{3}{4}$ in. long, then one $\frac{1}{2}$ in. long. The lines

are the same length. Someone notices that 12 is 4×3 and 16 is 4×4 and the reason is soon stated by some scholar. They are now asked to draw a line as long as $\frac{3}{4}$ in. but measured in eighths of an inch. The same kind of thing is found as before, and finally we get a series of equal fractions:—

$$\frac{3}{4} = \frac{12}{16} = \frac{6}{8} = \frac{9}{12}$$

This is repeated with another measurement and another series of equal fractions obtained. The scholars are now on the "track" of equivalent fractions and trying to express the rule for ascertaining when two fractions are equal. In all such work the scholars should write down their observations; this gives the slower scholars a chance to discover things for themselves.

When the rule has been formulated by a large majority of the scholars it is time to take some collective work to get the rule expressed in as good a form as possible, *e.g.*, "Two fractions are equal if the numerator and denominator of one multiplied or divided by the same number gives the numerator and denominator of the other, or "If both fractions can be shown to be equal to another fraction," etc. The reason is also understood, and scholars can express it in particular cases, *e.g.*, "If we multiply the denominator by two this will make the parts half the size, and we must take twice as many of them to get the same fraction as before."

Practice work is given in changing fractions, in showing by diagrams (using squared paper, circles, triangles, involving much practical geometry) that certain fractions are equivalent; the term "common denominator" is introduced and fractions expressed with the same denominator as required by such problems as "Is $\frac{4}{7}$ of a plot of ground equal to $\frac{1}{11}$ of the plot?"

[It will be observed that inductive work of the above kind lends itself very readily to division into the "Four Steps" (see Principles of Class Teaching, Chapter XIII.), although the steps have not been mentioned as such in the above sections.]

(c) *Addition and Subtraction.*—Simple problems are set which require the addition of fractions, *e.g.*, scholars are asked

to find what $\frac{1}{2}$ in. + $\frac{2}{3}$ in. makes, by reference to their rulers; the answer is given $\frac{7}{6}$ in.; this is written down $\frac{1}{2}$ in. + $\frac{2}{3}$ in. = $\frac{7}{6}$ in. The scholars must have noticed the $\frac{4}{6}$ in. equal to the $\frac{2}{3}$ in. when they were solving the problem, and their attention is drawn more directly to this by the question, "Could you have found the value of $\frac{1}{2}$ in. + $\frac{2}{3}$ in. without your rulers?" and the answer will be given " $\frac{1}{2}$ in. may be called $\frac{3}{6}$ in." Some scholars may find difficulty in adding $\frac{1}{2}$ in. and $\frac{2}{3}$ in.; they have not got thirds of an inch marked on their rulers; reference is made to simpler examples like the $\frac{1}{2}$ in. + $\frac{1}{3}$ in., and the fact is more clearly emphasised that both fractions are expressed with the same denominator for the purpose of adding. The fact that both fractions must be expressed with the same denominator never seems to cause any difficulty. Someone is quick to suggest that each can be expressed in twelfths, and we get:—

$$\frac{1''}{2} + \frac{1''}{3} = \frac{6''}{12} + \frac{4''}{12} = \frac{10''}{12} = \frac{5''}{6}$$

or taking $\frac{2''}{12} = \frac{1''}{6}$ we get

$$\frac{1''}{2} + \frac{1''}{3} = \frac{3''}{6} + \frac{2''}{6} = \frac{5''}{6}$$

Other examples of a similar kind are taken, *e.g.* (1) Find the value of

$$\frac{5''}{8} + \frac{9''}{16}$$

$$\frac{5''}{8} = \frac{10''}{16}$$

$$\frac{10''}{16} + \frac{9''}{16} = \frac{19''}{16} = 1'' + \frac{3''}{16}$$

(2) Draw a rectangle 3 in. by 2 in. and find the value of $\frac{3}{4}$ of the rectangle + $\frac{1}{4}$ rectangle. (If $\frac{1}{4}$ in. squared paper is used the twelfths are clearly marked.) Similar problems using other measures are set and the problem of finding the difference of fractions introduced; this presents no fresh difficulty.

The advantage of using the lowest common denominator will most likely not be realised until problems are set which require the addition of three or four fractions. For example,

in one case the scholars were required to add the following series of fractions:—

$$(i.) \quad \frac{1}{8} + \frac{3}{16} + \frac{5}{32}$$

$$(ii.) \quad \frac{3}{10} + \frac{4}{15} + \frac{3}{20}$$

$$(iii.) \quad \frac{2}{3} + \frac{5}{9} + \frac{5}{12}$$

$$(iv.) \quad \frac{5}{36} + \frac{5}{24}$$

The first three sums were solved by everyone in the same way, for the common denominator was simply *seen*; but in the fourth sum different denominators had been used by different scholars. Their solutions were put on the board, and it was agreed that the solution using the lowest common denominator was the easiest.

We have now arrived at "To add fractions we must reduce them to a common denominator, and it is easiest to use the lowest common denominator." The question now is "How to find the L.C.D. (or L.C.M. of the denominators)." The suggestions of the scholars will determine how the difficulty is to be attacked—the discussion will lead to an examination of the factors of each number, and, as one boy said (in the class in which the examples used in this Section were worked through), "Factorise each number and take out the factors you need," *i.e.*—

$$36 = 3 \times 3 \times 2 \times 2$$

$$24 = 3 \times 2 \times 2 \times 2$$

Then the L.C.M. must be a number which has for its prime factors 2 threes and 3 twos; the L.C.M. is:—

$$3 \times 3 \times 2 \times 2 \times 2 =$$

It may be noted here that in all subsequent work the L.C.M. is written down straight away, and left as a series of prime factors connected by the sign for multiplication. The factors by which each denominator has to be multiplied are then quite

obvious without requiring a series of divisions to be performed, e.g.:—

$$\begin{aligned} & 3\frac{2}{15} + \frac{1}{25} + 4\frac{8}{9} - \frac{13}{63} \\ & = 7 + \frac{210 + 63 + 1400 - 325}{5 \times 3 \times 5 \times 3 \times 7} = 1673 - 325 = 1348 \\ & \text{— etc.} \end{aligned}$$

The factors of each denominator are seen and only those not already entered as part of the L.C.M. are added.

Drill work in factorising and finding L.C.M. should now be given. Examples such as the above are set for drill work, also more problems requiring the representation of the fractions, e.g.:—A school garden is 60 yards long and 20 yards wide; it is divided into plots as follows:— $\frac{1}{3}$ for potatoes, $\frac{1}{4}$ for cabbage, $\frac{1}{8}$ for beet, $\frac{1}{8}$ for parsnips, and the remainder for beans. Draw a plan of the garden to scale showing the division into plots. Simple problems involving the addition and subtraction of fractions in connection with weights and measures and money, such as are found in any text-book, are also given.

(d) There is no need to take in detail the method of teaching multiplication and division of fractions. Teachers will discover much of interest in this connection in *The Psychology of Number* of McLellan & Dewey.

(e) The interchange of vulgar and decimal fractions is taken next, and the decimal equivalents of vulgar fractions most commonly met with should be committed to memory, e.g.:—

$$\frac{1}{2} = .5, \frac{1}{4} = .25, \frac{3}{4} = .75, \frac{1}{3} = .\dot{3}, \frac{2}{3} = .\dot{6}, \frac{1}{5} = .2, \frac{2}{5} = .4, \frac{3}{5} = .6, \frac{4}{5} = .8, \frac{1}{10} = .1, \frac{2}{10} = .2, \frac{3}{10} = .3, \frac{4}{10} = .4, \frac{5}{10} = .5, \frac{6}{10} = .6, \frac{7}{10} = .7, \frac{8}{10} = .8, \frac{9}{10} = .9, \text{ etc.,}$$

and also the most familiar percentages:—

$$\begin{aligned} 2\frac{1}{2}\% &= \frac{1}{20} \text{ (also 6d. in £1), } 5\% = \frac{1}{20} \text{ (also 1s. in £1).} \\ 33\frac{1}{3}\% &= \frac{1}{3}, \text{ etc.} \end{aligned}$$

Recurring decimals occur in such work, and the method of expressing them is shown; $\frac{1}{3} = .\dot{3}$ and $\frac{2}{3} = .\dot{6}$ are the only ones of importance at this stage, and if in the course of work a recurring decimal occurs the best method of treating it is discussed then and there. Sums set for the purpose of introducing operations with recurring decimals are not given, for they are for the most part meaningless and serve no useful purpose.

Practice Methods.—The syllabus states that practice methods are taught. This means that the scholars are made familiar with the method termed "Practice" for doing certain calculations, and they are ready to apply the method when opportunity offers. This does not necessitate the working of a large number of clumsy exercises of the type—"Find the cost of 4 bushels 3 pecks 1 gallon 2 quarts at £3. 17s. 4d. per quarter" (taken from a standard text-book). Many examples occur where a practice method may be used, and any scholar properly trained will use the method whether he knows the name "practice" or not.

For example—(1) Find the cost of 55 books at 1s. 8d. each.

	s.	d.
Cost at 2s. 0d. =	110	0
„ 4d. =	18	4
„ 1s. 8d. =	£4	11 8

(2)

$$\begin{array}{r}
 367.45 \times .725 \\
 \hline
 257.215 \quad (= .7 \text{ times}) \\
 9.18625 \quad (= .025 \text{ times} = \frac{1}{40}) \\
 \hline
 266.40125
 \end{array}$$

(3) Find the Compound Interest on £58. 15s. for two years at $3\frac{1}{4}\%$. (See Class VIII. Syllabus.)

	£	
1st year's int. =	$58.75 \times \frac{3}{80}$	
	1.4688	($2\frac{1}{2}\% = \frac{1}{40}$)
	.7344	($1\frac{1}{4}\% = \frac{1}{80}$)
	<hr/>	
2nd year's int. =	$60.9532 \times \frac{3}{80}$	
	1.5238	
	.7619	
	<hr/>	
Amount =	63.2389	
Principal =	58.75	

Compound Interest = £4.4889 = £4. 9s. 9d. to nearest 1d.

Decimalisation of Money.—The following method is used in many business houses and is the quickest, so far as we are aware, which is employed for this purpose. The result can be secured to any degree of accuracy. We give here the entire method, although the complete process is not employed until the scholars are familiar (in Class VI.) with the interchange of vulgar and decimal fractions. In Classes IV. and V. the steps preliminary to this work will be found in the syllabus.

A table is first worked out as follows:—

$$\begin{aligned} 2s. \text{ od.} &= £.1 \\ 1s. \text{ od.} &= £.05 \\ 6d. &= £.025 \\ \frac{1}{4}d. &= £.001 \\ 1s. \text{ 6d.} &= £.075 \end{aligned}$$

It is clear that the first decimal place will represent florins since every florin is £.1, e.g., 8s. = £.4.

The *first step* then is to pick out florins and the first decimal place is written down. [The £.001 is called a *mil*, and we say 1s. = 50 mils (£.050), 6d. = 25 mils, $\frac{1}{4}d.$ = 1 mil and $\frac{1}{8}d.$ = $3\frac{3}{4}$ mils ($.003\frac{3}{4}$), $2\frac{1}{2}d.$ = $11\frac{1}{4}$ mils ($.011\frac{1}{4}$) etc.]

The *second step* is to pick out from the sum of money given either 1s. 6d. (75 mils), 1s. (50 mils), or 6d. (25 mils). The number of mils thus obtained is noted mentally.

The *third step* is to change the remaining pence and farthings to farthings. Call them mils and 24ths; add the mils to those already obtained and *write down* the second and third decimal places.

When the scholars are learning it will be found sufficient to stop here and simply write, for example, 16s. $3\frac{1}{2}d.$ = £.814 $\frac{1}{4}$ or £.814 $\frac{1}{12}$.

So far, all the work has been done mentally and at a glance. We must now convert the 24ths to a decimal. This is the *fourth and last step*. If the fraction is one whose decimal equivalent is known, e.g., $\frac{3}{8} = \frac{1}{2} = .125$, then the remaining decimal places are added at once; if not, then we reduce the fraction in order to perform the division mentally. We cancel by 4 always; this gives a denominator of 6, and the numerator is simply the number of pence and decimals of a penny (above 6d.), which we have in the sum given.

Examples.—In the following examples the steps in the working are put down, but it must be understood that all the work is “mental” and the only figures written are those of the answer. This must be insisted on right from the beginning, and speed will soon be developed (20 seconds is ample time to decimalise any sum of money):—

1. £5. 17s. 3½d.

10s. 0d. = £.8 — £5.8.

1s. 0d. = 50 mils.

3½d. = 15½ mils — £5.865,

½d. = 2½ = 625 — £5.865625.

2. £8. 11s. 5d.

10s. 0d. = £.5 — £8.5.

1s. 0d. = 50 mils.

5d. = 20½ mils — £8.57083.

3. £4. 10s. 8d.

10s. 0d. = £.5 — £4.5.

8d. = ⅓ of 2s. = £.03 — £4.53.

When the scholars are familiar with the method the work may be shortened a little by missing out the “24ths” step and saying at once, for example, 5½d. = 22 mils + 5½ mils. And it will now be found easier to convert *all* the pence into farthings, and if 6d. is present add 1 and call them mils, *e.g.*:—

1. £3. 13s. 8½d.

12s. 0d. = £.6.

1s. 0d. = 50 mils.

8½d. = 34 farthings = 35 ½ mils.

£3. 13s. 8½d. = £3.685416.

2. £2. 6s. 10d.

10d. = 41 mils + ¼ mils.

£2. 6s. 10d. = £2.3416.

It has been found that very average scholars with a short practice each day for two or three weeks can decimalise any sum of money in a very short time. That the practice is worth it will not for a moment be questioned by those who, by experience, have found the value of this rule throughout all the work in arithmetic involving money. After the reverse process has been learned it is a matter of experience to decide when a sum of money shall be decimalised and when the decimal shall

be reconverted. In future the scholars must be on the look-out for chances to decimalise, and for a while the teacher may purposely introduce a large number of examples which clearly call for decimalisation. For example, the problem may necessitate finding the 25th part of £89. 10s. 6d.

$$\begin{aligned}\frac{£89. 10s. 6d.}{25} &= £8.9525 \times 4. \\ &= £35.81. \\ &= £3. 11s. 7\frac{1}{2}d. \text{ to nearest farthing.}\end{aligned}$$

This is all the "figuring" required and the sum is done in 30 seconds. Or again, find the Simple Interest on £803. 10s. for three years at 4%:—

$$\begin{aligned}\text{S.I.} &= \frac{£803.5 \times 4 \times 3}{100} \\ &= £8.635 \times 12. \\ &= £103.62 \\ &= £103. 12s. 5d. \text{ to nearest 1d.}\end{aligned}$$

The Reverse Process.—An approximation is sometimes necessary here, for we cannot always convert the decimal to its exact equivalent in £. s. d. We may go to the nearest 1d. or to the nearest $\frac{1}{4}d.$ as required, and at the most we shall never need more than four figures after the decimal point. The following shows the method of working to the nearest farthing, but the process may stop at any point if the required degree of accuracy has been attained:—

First Step.—The first decimal place represents florins.

Second Step.—From the mills pick out either 75 (1s. 6d.), 50 (1s.), or 25 (6d.) if one of these is present.

Third Step.—Call the remaining mills farthings, less $\frac{3}{4}$ ths of a mil, then:—

- (a) If three figures after the point are given, we subtract a farthing if we have more than 12 mills remaining after the second step.
- (b) If four figures are given, we must determine (see example) whether it is necessary to subtract a farthing or not.

Examples: (1) £3.596.

$$£.5 = 10s.$$

$$75 \text{ mils} = 1s. 6d.$$

$$21 \text{ mils} = 5\frac{1}{4}d. - \frac{2}{2}\frac{1}{4} \text{ mil} = 5d. \text{ to nearest } \frac{1}{4}d.$$

$$£3.596 = £3. 11s. 11d.$$

(2) £3.5968 = £3. 11s. 11 $\frac{1}{4}$ d. to nearest $\frac{1}{4}$ d., for at the last step we get $(-\frac{7}{8} + \frac{8}{10})$ mil, which is less than $\frac{1}{2}$ mil, hence we do not take $\frac{1}{4}$ d. off. [We might have said £3.5968 = £3.597 = £3. 11s. 11 $\frac{1}{4}$ d. But £.5964 could not have been written £.596 to work to the nearest $\frac{1}{4}$ d.]

$$(3) £4.7875 = £4. 15s. 9d.$$

$$£.7 = 14s.$$

$$£.0875 = \frac{7}{8} \text{ of } 2s. = 1s. 9d.$$

Square Root.—The work on areas will bring in the necessity for a rule to find the square root of a number. The rule will be given at this stage without attempting any other explanation than the use of the periods.

Ratio.—Ratio expresses the relation, with respect to magnitude, between quantities of the same kind. This relation, which has been implicit in all operations of multiplication, division and fractioning, is now made explicit.

We commence with the enquiry as to how to represent the size of one quantity *compared with* another, *e.g.*, length 2in. compared with 3in., that is the relation of 2in. to 3in. *as unity*. 2in. is $\frac{2}{3}$ of 3in. This comparison is expressed by the word "ratio," and we are said to find the *ratio* of 2in. to 3in. The ratio equals $\frac{2}{3}$, *i.e.*, 2in. is $\frac{2}{3}$ of 3in. In the same way 3in. is $\frac{3}{2}$ (read 3 halves) of 2in. and the ratio of 3in. to 2in. is written $\frac{3}{2}$. Every ratio is expressed in this fractional form and conversely every fraction represents a ratio, *e.g.*, $\frac{6}{7}$, 6 is $\frac{6}{7}$ of 7 and 7 is $\frac{7}{6}$ of 6, *i.e.*, the fraction expresses completely the relation of 6 to 7 as unity and of 7 to 6 as unity.

The scholars express a large number of ratios and the examples make clear that the quantities must be of the same kind and expressed in the same units. Ratios are experi-

mentally determined in the Science work, and such problems should be set in these words: "Find the ratio of," etc. (see p. 213).

Constant Ratio and Proportion. (See Syllabus VI.-VII).—

Certain ratios measured by the scholars are found to be constant, *e.g.*:—The scholars are asked to find the ratio of the height of an equilateral triangle to the length of the base. The scholars draw triangles of various sizes and find on comparing results that the ratio is approximately the same in each case—the ratio is said to be *constant*.

The scholars are asked to give examples of other constant ratios, *e.g.*:—

$$\frac{\text{Circumference of a circle}}{\text{Diameter}} = \frac{22}{7};$$

diagonal of square to side of square; examples from bartering, *number* of eggs to *number* of pence paid (only true for small quantities), etc.

The graphs showing the variation of such quantities are drawn and found to be all straight lines passing through the origin.

The above relations may be expressed in another way, as may be seen if a series of values are put down as follows:—

Circumference	...	22	11	33	44	66	cms.
Diameter	.....	7	$3\frac{1}{2}$	$10\frac{1}{2}$	14	21	cms.

The ratio of any pair of circumferences is equal to the ratio of the corresponding pair of diameters $\frac{22}{7} = \frac{33}{10\frac{1}{2}}$ etc. The term "proportional to" is introduced—the circumference is said to be proportional to the diameter.

The work for some time now deals with proportion until the scholars thoroughly understand the meaning of "proportional to" (though their method of expressing the fact may be to say, "If the base is doubled the height is doubled," etc.). The scholars are asked for examples, and in every case the pairs of ratios are written down and their equality tested either by cancelling in simple cases, by cross multiplication or by the

standard test, *e.g.*:—Is $\frac{22}{7} = \frac{33}{10\frac{1}{2}}$? 7 is $\frac{7}{22}$ of 22, then $10\frac{1}{2}$ should be $\frac{7}{22}$ of 33: or 22 is $\frac{2}{3}$ of 33 then 7 should be $\frac{2}{3}$ of $10\frac{1}{2}$.

The two equal ratios are said to "make a *proportion*" and the 4 numbers are said to be "in proportion." Some exercises are given in completing proportions—given three terms to find the fourth—the proportion is always expressed as two equal fractions.

In the early problems involving the principle of proportion (not problems worked "by proportion" as if proportion were some rule for solving problems) the scholars should be required to express in words the fact that certain measurements are in proportion (and if any supposition is implied this should be clear). The equal ratios will then be written down and the missing term be expressed by x or some other symbol, *e.g.*:—

If 38 men, all paid at the same rate, earn £3. 3s. 4d., what will 133 such men earn? The amount of money paid in wages is proportional to the number of men working:—

$$(a) \frac{38}{133} = \frac{\text{£3. 3s. 4d.}}{\frac{133}{38} \text{ of £3. 3s. 4d.}}$$

This is then stated as follows:—

(b) If 38 men earn £3. 3s. 4d.

Then 133 men earn $\frac{\text{£3. 3s. 4d.} \times 133}{38}$

(since there are $\frac{133}{38}$ times as many men).

It is only a question now of the easiest method of working out the result. Shall the £. s. d. be left as such or decimalised or expressed as a vulgar fraction? Attention is drawn to the factors of the numbers 133 and 38; this leads to two possible short methods:—(1) 19 is a factor of 38, and £3. 3s. 4d. expressed as £3 $\frac{1}{2}$ will give the factor 19 in the numerator, or (2) 19 may divide into 133. The only divisor we need try is 7 (since 7×9 gives a 3 in units place).

So we get either—

$$\frac{\text{£3. 3s. 4d.} \times 133}{38} = \text{£} \frac{19 \times 133}{6 \times 38} = \text{£} \frac{133}{12} = \text{£11. 1s. 8d.,}$$

$$\text{or } \frac{\text{£3. 3s. 4d.} \times 133}{38} = \text{£11. 1s. 8d.}$$

The scholars may soon be allowed to dispense with writing down the equal ratios, as in (a), and write only the statement, as in (b). As soon as a problem is seen to involve proportion the solution is written down as a certain quantity multiplied by a fraction or series of fractions representing the ratios of the magnitudes of the quantities involved. The question of inverse proportion is sure to arise in studying the variation of magnitudes of quantities, and examples are not lacking in the Science course. This should present no difficulty if the direct proportion has been thoroughly understood. . . .

It may be noted here that scholars should be encouraged to make up problems for themselves; this applies also to other parts of Mathematics. The ability to invent a problem (of an original type) shows a grasp of the principle involved equally with the ability to solve a problem.

It forms an interesting type of problem to give a series of pairs of values for two variable quantities, *e.g.*, corresponding readings on Centigrade and Fahrenheit scales, and ask the scholars to find out if the values are in proportion or in inverse proportion. If neither of these, to see if they can discover the relation, *i.e.*, the function which one is of the other; the graphical work in this connection is very instructive.

Class VIII.—The topics treated in text-books under the headings of "Interest," "Profit and Loss," "Discount," "Stocks and Shares," etc., are applications of this principle of proportion and of working in percentages as a common basis of reckoning. Some teachers would cut these out of the syllabus as being too remote from the scholars' experience to be of any value. But if such topics are taken solely in connection with the newspapers and other commercial papers, and examples supplied by parents, they are found to be interesting to scholars in their last year at school. In the same way some insight is gained into the principles of book-keeping. The accounts kept in connection with the school camp, garden and games funds have been found to provide adequate material. The school classes should not enter into the *details* of book-keeping; for every firm in the city has some method peculiar to itself, but the *fundamental principles* apply everywhere. If our scholars are required to keep our own small accounts they will want to

know something of book-keeping, and the study can be made of a very practical nature. Some of the older boys and girls also give assistance in the routine of our school office with the same purpose in view. (See p. 35.)

A. S. HARRISON.

Note.—Since the above notes were written a pamphlet, "*Suggestions for the Teaching of Arithmetic*" (Circular 807), has been issued by the Board of Education. Some of the methods shown in the above notes are advocated in the circular (see especially paragraphs 5, 12, 15, 25, 41, 56), and although much of the circular is taken up with generalisations which can be appreciated only by the experienced teacher, it should be read with profit by all teachers of elementary arithmetic. In addition to the general acknowledgment in the preface, we should express our obligation to Mr. W. J. Deeley, B.A., late Head Master of the Fielden School, for his investigations in the teaching of Arithmetic; many of which have been introduced into this chapter.

CHAPTER XV.

ELEMENTARY PLANE GEOMETRY.

For a thorough understanding of the situation in England as regards the acquirement of Geometry in schools, the student needs to begin with the agitation led by Professor Perry (Brit. Assn., Glasgow, 1902) ten years ago. Such an investigation is necessary for any teacher of Mathematics at the present time, since the schools are still in perplexity. This is, however, not the place to discuss those perplexities; the reference list at the end of this chapter may serve as a guide. During the last five years we have endeavoured at the Fielden Schools to work out with the scholars a reasonable method of mastering the elements of Geometry, and we offer here a sketch of the syllabus, prefaced by the grounds on which we commend it.

1. GROWTH OF GEOMETRICAL EXPERIENCE.—It is a commonplace that the child, long before he comes to school, is gaining those basal experiences of space and form which underlie all later acquisition. In the kindergarten these are defined (sometimes to excess) by giving the young scholar balls, cubes, "bricks," etc., which help to familiarise his mind with precise limits both of line, surface and solid. At this stage, and for the next few years, he should not be offered any formal teaching on such matters, but he will be collecting, on the margin of attention, a body of ideas more or less accurate, accompanied by a vocabulary such as is used by his elders, relating to angle, line, solid, area, etc.

At about nine most scholars can commence a definite course of mathematical study, *i.e.*, they can begin to *measure*, to select standards, and to employ units, thus defining experience in terms of exact quantity (*exact*, *i.e.*, within the limits of their instruments). Man at this stage of growth becomes a measuring creature, the foundation of all later mathematics is here laid, for the fundamental notions of multiplication and division, of ratio and monetary value, of direction, are all found in such efforts. The child begins to subdue his little world by means of the yard-stick. And at the same time, by means of

well-disciplined drill, he can not only gain an empirical mastery of these ideas, but can learn to use the tools of calculation with rapidity and precision. Great progress has been made in the last ten years in working out schemes of study for this period. They are commonly grouped under the title of "Practical" Arithmetic (see Mathematics Syllabus, Chapter XIII.), though that title is misleading, since Geometry and Algebra also make a start along with Arithmetic. At the Fielden School we have been especially indebted to the books written by Consterdine and Andrew, with the apparatus which they devised to accompany their exercises; although a capable teacher can often find equally serviceable material in his immediate surroundings.

So far as Geometry is concerned, in the years from nine to twelve, a scholar can accumulate a large amount of useful practical knowledge on so-called inductive methods, associated with measurement (*i.e.*, with Arithmetic, see p. 207) and covering much of the ground formerly treated by art teachers as "Geometrical Drawing." He measures, and gains clear concepts of, lines, angles, areas, circles. By perceptual motor experience he brings to a head all the vague impressions of form and space that have accumulated since babyhood, and he accepts a large stock of elementary truths which to him are by these means satisfactorily "proved."

It is in the sequel to this type of experience that the great stumbling-block has been found in the schools. Superimposed on this stage of development there ensues, in minds of good quality, a higher capacity, which we may call a capacity for *formal* reasoning or argument; the growing mind can work on this higher level and begins to "argue." The beginning here made with Mathematics extends in later years among scholars and thinkers to every field of human experience.¹ In Geometry the scholar finds himself able to separate, to abstract the idea from the image, and then to recombine these ideas so as to create a new structure.

An absorbing interest to a student of young minds is to note the emergence of this new power, and especially to watch over

¹ As regards moral ideas, compare the present writer's *Growth of Moral Ideas in Children* (Vol. I. of Sadler's *Moral Instruction and Training in Schools*).

its first efforts. In our experience it takes, with average scholars, something like six months before they find themselves in this novel method of handling geometrical facts. Of course, there are precocious young people who find no difficulty in passing from fact to theory. Some distinguished mathematicians have been able to tackle theoretical geometry before the age of ten; but average scholars, in our experience, ought not to make that attempt until twelve, and then require very careful handling for a few months; after that critical period they sometimes make rapid advance.

The teacher undertaking to help his scholars over this delicate ground must be himself quite clear as to his goal; he must recognise that the new wine cannot be contained in the old bottles. The scholar has how to argue, to rely wholly upon argument. To put this caution in a sentence one may say, "When you start arguing, cease measuring!" Unfortunately, many teachers, impressed by the value of the earlier experience in "practical" work, often fail to realise the necessity for this sharp severance between new and old; and many current textbooks (to say nothing of obscurantist syllabuses issued by Local Examination Boards) mix up the two, sandwiching chapters on measurement with chapters of a Euclidean type.

If mathematicians would only reflect upon the psychology of Mathematics they would soon be convinced that these compromises make confusion in the philosophy of the subject as much as in the method of teaching. For, in the earlier practical work, the scholar's success depended upon an accurately measured picture. He was bidden to draw carefully with ruler and compass; he was convinced that things were equal because they were made to look so by the ruler. But theoretical geometry is independent of appearance; it must be *in the mind*, apart from sketches made on paper or blackboard. The figure, hastily put together, is merely a prop to help the arguer to imagine abstract relationships. Hence the first step to take is to banish ruler and compass and encourage the scholar to make free drawings, which are just sufficiently accurate for the purpose of recalling to his thought, without discord, the phenomena before his mind. In other words, he is now to learn, not by the aid of perceptual experience, but by pure argument, even

when sight would contradict the deduction. All this is quite familiar to the adult geometrician, but it has been largely overlooked in the years of confusion which have followed on the dismissal of Euclid.

2. Our goal then is clear, and teachers of "the old school" who delighted to drive young people through Euclid I. and II. before the days of Perry will be glad to see that we are reverting to the severe and simple doctrines of the olden time. But it is one thing to have a clear goal; it is another matter to arrive at it! It was only the select few among our pupils in those days who ever understood the propositions of Euclid; still smaller were the number who learnt to argue in Geometry for themselves. How remarkably clever was a boy considered if he could "do riders"!

The teacher undertaking to start a class in geometrical argument must expect that most of his scholars will at first withstand his invitation, simply because they have hitherto had *no experience of the kind*. This formal effort to "prove" things merely by talking about them is utterly novel. True enough, on the margin of attention, they have been reasoning all their lives; but it is quite a different matter to bring argument in formal fashion above the threshold of consciousness, holding together a series of facts and being convinced, after meditating on them, that a conclusion is sound. The teacher may repeat "Therefore the angle of $A B C$ equals the angle $X Y Z$ " until his tongue wearies, but mere repetition of his voice will not induce in his scholars a new mental habit. It is at this point that pedagogical skill asserts itself. We have no evidence that Euclid was written for boys and girls; on the contrary, it was as an advanced contribution to science studied by select adult minds. It was maintained during the centuries as a mathematical text-book because it presented a fairly harmonious logical scheme of thinking, such as a ripe intelligence, grown familiar with the possibility of devising a complete mental structure, can happily welcome. The teacher's business is obviously different. He has to *introduce* his scholars to geometrical thinking, and the logical completeness of the geometrical edifice need not concern him at all. This anxiety to construct a complete logic of Geometry is only a hindrance.

for such a structure is so complicated and philosophically elaborate as to be entirely beyond his scholars' comprehension at the outset. Some mathematicians will cavil at this situation, for they will point out that geometrical thinking implies *per se* the erection of a logical structure, which must begin where it only can begin—by a sound foundation in well-organised postulates and axioms, succeeded by thorough proofs of the properties of parallel lines and congruent triangles.

But it is not impossible to find a compromise, and we are indebted very largely to Mr. W. C. Fletcher¹ (now Chief Inspector for Secondary Schools) for the advice which he has given, based on his own work as a schoolmaster, to reconcile the apparent conflicts between adult logic and child psychology. He points out that a school course in Geometry may quite properly *assume without proof*, not only the axioms and postulates, but the properties of parallel lines and of congruent triangles. The beginner needs to try his wings first on a proposition which presents some really novel issue, and at the same time is not too wordy or intricate. His difficulty is to understand the mode of thought; short flights, with clear objective, should be offered him in these early attempts.

There is nothing illogical in assuming, for the purposes of argument, the facts and discussions contained in Euclid I, 4, 8, 26, 27, 28, 29; the understanding of the idea creates sufficient difficulty to the beginner without his being involved in the complicated language necessary to master a proof of the propositions.

3. This point of language is worth a moment's notice. Sound argument depends upon precision of speech; every term must be used in a uniform sense, and no novelty or variation can be permitted. The vague language of popular speech is replaced by the consistent adoption of technical terms. In constructing the Fielden School course the greatest attention has been paid to this point, and much is achieved if, after a few months, the scholars themselves acquire the habit of truth in the speech they employ for geometrical argument. The scholars work out in discussion the simplest form of words to express the definition, and these

¹*The Teaching of Geometry and Algebra in Secondary Schools* (Board of Education, 1907).

are then recorded in their note-book as a glossary or set of definitions. These introductory studies in definitions are associated with general and particular statements, making clear the distinction between Hypothesis and Conclusion.

The choice of language is bound up with the employment of a text-book. The scholar is little helped by having a complete text-book placed in his hands, for the whole purpose of the study is to enable him to hold *in his mind* a sequence of experiences in which the language as well as the argument has been appropriated step by step as his own property. The text-book can at best serve as a work of reference, which he may turn to if his memory is at fault.

A text-book is, in fact, more serviceable to the teachers than to the class; it is very seldom that a class either in the Fielden School or elsewhere is guided right through a course of Mathematics by the same teacher; hence an agreement must be made as to the language as well as to the syllabus to be employed, and some authorised text must therefore be adopted since everyone who shares in the teaching is bound to familiarise himself with the forms of speech before he can intrude upon the proceedings.

It is here that one chief difficulty is found by teachers placed in charge of a class for a brief period; each has been accustomed in his school and college mathematics to a different system, and may fail to realise the rigid demand for accepting the precise scheme on which the class before him has been exercised. This presents a situation where uniformity and discipline are essential, where freedom and initiative on the teacher's part are out of place, since the common and continuous geometrical thinking of a class involve social unity to which the teacher's tastes have to give way. To meet our requirements without adopting a printed text we have used files (kindly supplied to us at first for our experiment by the Stolzenberg Company). A file is given to each scholar, and his text-book has been constructed page by page in class; copies of a final draft are then hectographed and given to each scholar. Thus, at the end of two years, each has a text-book of his own.

4. TIME TO BE DEVOTED TO THIS STUDY.—Hitherto we have taken two lesson periods per week, with sometimes one home

lesson. For the beginner double this time is preferable. We have for long advocated the "intensive" plan (see *P.C.T.*, p. 119) for the beginnings of all new studies. All the mathematics of a class is assigned to the same teacher (for, say, five periods a week). We counsel him, when beginning theoretical geometry, to appropriate four of them to Geometry for at least one term, in order to break ground in this new mode of thinking, dropping for the time being most of the Arithmetic or Algebra and balancing the loss at a subsequent date. Many scholars simply cannot get hold of a new pursuit if their attention is only drawn to it on two occasions per week. It is a different matter when the study has gained a firm lodgment in the mind.

SYLLABUS.

(Commenced in Class VII. each September.)

Section I.: Lines and Angles.—Line is defined in terms of direction (*point* needs no definition); two lines (*arms*) drawn from an (angular) point form an *angle*. The standard angle (the class having become familiar with the conception of a "standard" in previous years) is the "straight" angle, formed by arms running in precisely opposite directions. (The idea of revolving arms is discussed, but not dwelt upon, since negative and reflex angles play little part in Mathematics before the commencement of Trigonometry.) The introduction of the term "supplementary" leads to the First General Statement (Euclid I, 13), which is taken as self-evident, but carefully examined, with the figure drawn in many positions and variety of lettering. Euclid I, 15, follows, treated in the same way, and the terms *ray* and *right angle* present no difficulty.

At this point a few exercises are introduced. Exercises are distinguished from other work merely by the fact that it is easy for the scholar to undertake them without discussion or explanation; and he should have ample time both to think out the statement and write down the conclusion in fit language.

Section II.—Parallel lines are now easily defined in terms of direction, and the scholar readily admits that if a transversal be drawn, the *corresponding angles* are always equal since the arms *correspond* in direction. Plenty of time is required to enable the beginner to name the eight angles observed in the

figure. When he has done so he can undertake his first formal proof. By strictly expressed argument he can "discover" a truth which will come to him as a real novelty, viz., that the two interior angles added together make a straight angle. (He might also "prove" that the alternate angles are equal, but this is so obvious to the eye that he is not so greatly impressed by the need for argument about it.) It is interesting here to note that the arguments best adapted for making a start with formal "proof" are those which not only have an element of unexpectedness, but are such as involve the process of addition—(see below: the sum of the three angles of a triangle). When the scholars, with more or less aid, have realised the argument as argument the time has come to fix the new acquisition by formal elaboration: Statement, Hypothesis or Data, Conclusion, Particular Statement, Proof (by reference to Section I.). Time is required, but will be well repaid since habits are being formed to last.

Exercises follow, the chief being the sum of the three angles of a triangle. This is so important that it also should be formally handled and written out; it has the additional advantage that it introduces a Construction. As a sequel to this, other exercises can be taken at discretion, and abundant time should be allowed for them, since it is only by studying the situation in a variety of postures that the scholar can be led to realise the value of the truth he is accepting. We seek to classify these exercises into types, varying according to the amount of initiative left to the scholar.

The teacher, before proposing them, needs to anticipate carefully the point where the scholar will encounter the crucial difficulty. It is a useful exercise for teachers to elaborate an argument occasionally in syllogistic form, and note the Middle Term which has to be found in order to solve the riddle.

If a class spends twelve or more lesson periods over this section we should not reproach the teacher, for the test of progress is capacity for handling the new tool of thought, and the next section requires still more concentration of mind.

Section III.: Congruent Triangles.—We cannot spare space to write detailed Lesson Notes. It is important to let the scholar arrange the triangles in many positions; the ordinary

text-book arrangement with corresponding sides drawn parallel is obviously misleading. The root difficulty is to apprehend the distinction between congruency and equality; a formal definition supplied by the teacher is of little use. Further, the scholar should see that these "conditions of congruency" are not an affair of triangles merely, but he should recognise a similar situation in the square, the oblong, etc. He should omit the ambiguous case, for he will not run up against it in practice for a long while, and beginners seldom raise the point; if an exceptional scholar does discover the difficulty he is likely to make rapid progress and should be allowed to work it out for himself.

The conditions and conclusions should be expressed in a variety of language, within the limits of the technical glossary adopted; the terms *vertical angle*, *base*, *corresponding*, *opposite* all need careful introduction. A few exercises, such as the square and regular hexagon supply, will lead on to the matter of Euclid I., 5, 6 (but not to the method). All that the teacher has to do is to bisect the base of an *isosceles* triangle, join the new point to the vertex and leave the class to recognise the situation as one concerned with congruent triangles in a particular situation.

Then the converse supplies a first example of treatment which will certainly recur, Hypothesis and Conclusion changing parts; hence time will not be wasted in dwelling upon it. The class must realise that the proposition as enunciated in Euclid I., 5 is not the only, or the most significant, result of the situation. The term *right bisector* should be adopted and the image of it retained, for it is the portal to Symmetry, Loci and Chords of the Circle.

Section IV.—We are now fairly launched in the subject, and the order of subsequent sections is not a matter of the first importance. Inequalities in triangles are easy and can be quickly handled, and the necessary time is well spent. We have followed this by Areas, although The Circle would do just as well. The circle, owing to the fact that Euclid kept it back till Book III., is often delayed until a first course in Geometry is completed; but this is a great injustice. There is an æsthetic element in this part of Geometry which renders it

very attractive, and in manifold relations to the world outside of Geometry the circle plays a great part. Scholars are glad to learn something about it, and the work is easy.

The treatment of Area in the text-books is often unworthy. The scholar has already measured area in his Arithmetic studies, and if he is now required to wade through a series of propositions "between the same parallels" he seldom realises the relation between number and space. Here, again, care in the "Preparation" is half the battle. Let him get clear as to the use of the terms *base* and *altitude*, and reconcile his mensuration with his geometry by the statement that parallelograms with equal bases and equal altitudes are equal in area, being equal to the rectangle made by the base and the altitude. He will soon come to see that the method of comparing equalities by congruency of triangles can be adjusted to the method of comparing by the unit of square measurement.

There is one piece of work which we have not made prominent at the Fielden Schools, but a place may well be found for it. We assume, quite properly, the right of the scholar to draw a right angle (*i.e.*, to bisect the straight angle), a line and so forth. But when he has once broken well away from practical, quantitative geometry, and has grown accustomed to using this new tool of geometrical reasoning, it is as well for him to learn that the compass and the straight-edge will provide him with accurate figures without the use of protractor or graduated rule; and, what is equally important, that his recently found geometrical knowledge will give him logical proof that the constructions studied when he was younger can be "proved" to be correct. Hence a section on the Construction of Figures beginning with the bisection of an angle is not out of place. As exercises he may use his compasses to draw accurately some of the figures sketched in the arguments of previous sections.

At this point, too, time can fairly be taken from periods assigned to Arithmetic and Algebra in order to work exercises (useful to the surveyor and the engineer) involving quantities. Godfrey and Siddons' Elementary Geometry (last 30 pp.) provide good examples of what we mean. The scholar is here resuming methods of study commenced in earlier years as Practical Arithmetic; but we differ (as stated above) from that and other

text-books in that we demand a rigid severance from measurement for at least twelve months in order that by exclusive attention to argument the scholar may form these new habits of geometrical thought. Obviously the quality of the exercises now undertaken should extend much beyond the range possible at the earlier stage. In a similar way simultaneous and quadratic equations can be worked along with the geometry of Area and Circle and with Graphs, thus opening the way for Co-ordinate Geometry, Trigonometry and Conic Sections, which some of our scholars will take up in technical institutions after leaving us.

But the time is limited and it is equally important that opportunity should be found for work on Loci and Symmetry since these topics have many practical bearings; nor can the treatment of Ratio and Proportion (Similar Figures) in connection with number be entirely neglected.

We have omitted many minor matters which bulk large in some text-books; these are sometimes omitted entirely, or are treated as exercises. Since we have no external examination to prepare for we can consider solely the needs of our scholars, selecting from all the possible topics (1) those which help to make up a coherent system of argument, (2) those which have the largest bearing on other fields of experience. In the later months of a two-years' course considerable variety of choice may be fairly claimed by the teacher; it is in the earlier sections, when the foundations are being laid, that the greatest skill is required; a scholar's mastery or failure in mathematical thinking is often determined for life by the care of his teacher at this period.

Teachers of Mathematics engaged in preparing scholars for examinations may think that we lose by having no external examination in view. On the contrary, we feel that, in the present condition of affairs as regards Geometry, freedom is essential to our aim. If the "bookwork" had to be so closely revised as to be ready in text-book form for repetition on paper on a stated day some years hence, our scholars would be compelled to fasten their chief attention on this form, and could not give their minds to the slow process of thinking all round the large topics which are offered as problems for investigation.

Until the public examinations can be so conducted in this subject as to test solely the scholar's command of argument, they constitute a hindrance rather than an aid to progress. Possibly a few of these young folk abuse their freedom and are not driven with so tight a hand as other boys and girls who feel the spur of the public system; but until the method of testing is altered, we prefer that a few should be lacking in diligence rather than that all should be fettered in the free exercise of thought on this higher level of intelligence to which they are aspiring. In spite of the reforms which we noticed at the outset of this paper, Geometry in many quarters is still a machine, which keeps the young at a low level of stupidity and rote learning, whereas it can, and should be, a means of happy enlightenment and of intellectual delight.

J. J. FINDLAY.

REFERENCES.—Perry: *Proceedings of the Glasgow Meeting of the British Association*, 1901 (republished with other matter by Macmillans, 1902). J. N. Wilson: *Elementary Plane Geometry*, Parts I. and II., 1868. (The introduction is important.) The above are important for their historical interest. Among elementary text-books now in use which contain material suggestive to teachers the following are worth consulting:—W. C. Fletcher: *Elementary Geometry*, 1901. G. A. Wentworth: *Plane Geometry* (Boston, U.S.A., 1901). Eggar: *Elementary Geometry*, 1905. Workman & Cracknell: *Geometry, Theoretical and Practical*, 2 vols., 1908. Coates: *A First Book of Geometry*, 1911. David Mavi, *A School Course of Mathematics*, Oxford, 1907. For other books on Geometry in relation to Algebra and Arithmetic, see p. 216 above.

APPENDICES.

APPENDIX I.

EXAMPLES OF SCHOLARS' WORK IN ILLUSTRATION OF CHAPTERS IV. TO VII. AND IX.

A word of caution lest the purpose of these examples should be misunderstood. They are reproduced merely to enable the reader to realise better the kind of reaction children may be expected to make in face of the distinctive problems and situations which they encounter in the scheme of teaching here put forward. The reader is not invited to describe them as "good" or "bad." We are not submitting them for that purpose, but to help to an appreciation of the way in which History and Literature "appeal," as we say. If an experience in any kind of life counts for much, it evokes a response. Here is the sort of response which one may hope to get when we give a start or clue from which the scholar can set out to "express" himself.

A. "Tapestries." Figs. 1 and 2 from Class IV. The class were engaged on the Norman Conquest (see p. 68). They were shown reproductions of the Bayeux Tapestry, were provided with pieces of brown canvas (3ft. x 2ft.) and smaller pieces of coloured cloths. From the latter they cut out pieces, which they then stitched on to the ground cloth, and produced, not a tapestry, but an *appliqué*. These have been photographed and reproduced in Plates 6 and 7. Some of the effect is lost by the absence of the colours, but the method of work is evident.

B. Imitations of Mediæval Documents. After seeing copies of illuminated manuscripts and realising the important part played by "letters" in human intercourse, the scholars are invited to copy the style. Plate 8 is a reproduction (minus the colours) of such an effort. The handwriting has not had the advantage of the system described in Chapter VIII. The defects in spelling shew that this scholar is still uncertain. When he finds (from the criticism of his comrades as well as of his teacher) that erroneous spelling spoils the effect he is more willing to undergo the drudgery involved in acquiring correct spelling habits. If the scholar, while absorbed in this task, had his attention switched off to the correction of spelling errors his efforts as an artist would have been hindered. Technique, both in spelling and in other arts involved in this work, is quite important, but the teacher's skill is shewn in refraining from interference while the scholar is absorbed in what, to him, is original production. These documents are produced on good drawing paper (30in. x 22in.).

The text of another such production runs thus:—

"Canute King of all England and of Denmark; Norway and part of Sweden to Alfric Archbishop of York and to the whole nation of the English both the nobles and the commons; greeting."

I notify to you that I have lately taken a journey to Rome to pray for the forgiveness of my sins. By the help of God I swear to rule my people like a just King.

I have asked the Lord Pope to stop these unjust Tolls. I write this in the name of Christ.

Another production runs as follows:—

Matilda wrote a letter to the people in England asking them to accept her as Queen this is like what she wrote—

To the people of England.

I want you to accept me as Queen, besides you swore to my father that you would. I also have the laws of my father King Henry the first, also I will keep the big Norman Barons down.

Now I ask will you all be loyle to me, and accept my husband as well.

Witness Geoffery my husband

Matilda, Princess of England.

The following are from younger children:—

To the Great King Egbert at Wessex from your brother at Whitby Abbey.

We are in great trouble—please send some soldiers to help us for the danes have come and plundered are monastery. We are having to live in the forest caves now.

We have managed to rescue a few cronicles and a few pens and ink but not much jewellery.

The Tale of Othere to Alfred the Truth-Teller.

"Oh great King I have a story to tell you about my adventures on going to the North Cape. I went on a big ship and took six men with me. Sometimes we came across great ice-bergs so we had to fire holes out of them. Sometimes we had to bore holes out of them. In three days we caught three score whales. We sometimes caught a few walruscs but not very often.

This happened in the six months that the sun shone.

At the North Cape the sun shines for six months and then the weather is dull for six months.

Although the sun shone very britly it was bitterly cold.

Here is a walrus tooth to be a proof to you that I have been there."

King Alfred bids greet his daughter Ethelgiva lovingly.

I wrighte to tell you that I am so busy and the time passes so quickly that I have invented a clock. I have to get six candals each which has 12 marks on it each candle lasts four hours. Is your abbey prospering. My shcool is. Asser came to see me yesterday.

From your father Ælfred.

C. Drama. No teaching is given in dramatic technique. This can well be relegated to a later stage of experience (see, e.g., Perse Grammar School Plays, Heffer & Sons, Cambridge).

1912). To children of nine and ten drama is, like the documents printed above, a means by which they bring out the essence of a situation as they conceive it.

A PLAY ON THOMAS A BECKET.

Characters:

Henry II., Thomas à Becket, Messenger, Four Knights, Monks.

SCENE I.

Henry's Rage.

Messenger: Sire, I bring you bad news about Becket.

Henry: Sir, what news what has he been doing while I have been here.

Messenger: He has dismissed the Bishop of York and the Bishop of Salisbury, here they are to answer for themselves.

Both Bishops: May it please your Majesty that the Archbishop of Canterbury has dismissed us from our offices.

Henry in a rage: What for, why has he dismissed.

Bishops: Because we have displeased so he says.

Henry: *Here is a man who eats my bread a pitiful fellow that came to my court on a sorry hackney lifting his heel against me and insulting my kindred. What a pack of Cowards I have nourished in my house that not one will avenge me of this upstart clerk.

* (By consultation of History Text book.)

SCENE II.

In the church at Canterbury.

Knights: Will you pardon the Bishops.

Becket: No I will not pardon them, they have displeased me. I shall dismissed them.

Knights: You will pardon them or you will be killed.

Becket: I will not pardon them. (Knights go out and buckle on armour.)

SCENE III.

Murder of Becket.

Frightened Monks: What are you doing that for? Let us shut the doors.

Becket: No do not shut the doors (in rush the knights at that moment with drawn swords shouting at the same time.)

Knights: Pardon the bishops.

Becket: No I will not pardon them.

Knights: He must lose is live.

Fits Urse: Strike strike kill the traitor (William Oracy leaps upon him and kills him).

The End. SCENE IV.

(News brought to the King who bursts in loud lamentations and says).

King: Of if I had not spoken before those knights, O why did they not no I was not in earnest. I will do penitence for it (he rings the bell, enter servant).

Servant: I am here to please you my lord sirrah.

Henry: Go quickly and tell the monks I will come and do penance at the shrine of Becket.

The following was prepared by Class III.:—

DUKE WILLIAM.

Characters:

Duke William, Messenger, Barons Dukes' Counsellor.

Scene—in the Court yard. William waits for his horse.

SCENE I.—Duke William and the Messenger.

William (drawing on his glove): Oh dear I wish they would hurry with my horse.

C.: Shall I go and tell them (goes out) But before going there comes a messenger, running in out of breath, kneels down and says, your Majesty, news.

W.: Speak.

M.: Your Majesty, I have heard that Edward the Confessor, King of England, has died and Harold has been crowned King of England.

W.: You lie messenger.

M.: I do not. (William gets in an awful rage.)

C. (kneeling): Your Majesty do not enrage so much but let me give you good advice.

W.: Speak.

C.: You had better ask the Barons for I think they would give you good advice.

W.: We will meet in a week hence at 9 o'clock in the morning.

SCENE II.—The meeting outside the City wall.

W.: I have called you together to-day to tell you that that wicked Harold has ceased the Crown although he promised it me will you fight for me. (Barons murmur together for they knew he had conquered them before. So some shout yes and some no.)

W.: Well I will give you lands and money and make you rich. Some Barons say yes.

W.: Well fight well and do your best.

D. Verse. We have no desire to impose verse composition as a regular exercise, but the same rule applies here as in the other arts. When the form of ballad poetry lays hold of the youngster he tends to imitate, and the effort may be presumed to help the composer to a better control of prose.

While at work on the Welsh wars the following was presented:—

The Welsh they fought so very hard

To get their country free

But the English had more power than them

So the Welshmen had to flee.

But still the Welsh they tried again

The English for to beat

But alas the English won the day

And the Welsh they did retreat.

Men of Wales, gird on your armour

For the battle fierce and long

Edward's men are on us marching

Singing as they tramp along.

A scholar in Class III. offered the following:—

THE BATTLE OF STAMFORD BRIDGE.

When Harold left his ship
 He never thought to fight
 Their Byrnies they left on board.
 For the day was hot and bright.
 They saw a cloud of dust
 Rising from the East.
 And well they knew
 That they must go.
 And get their armour on.
 The Hosts of battle met.
 And fierce was the fight.
 The Norsemen won just yet
 But soon some went to flight.
 Harold Hardrada was kild.
 And the cruel Toslig also.
 Harold of England won
 And made an end of his foe.

E. Composition on Miscellaneous Themes. It is a mistake to confine the literary art to the subject-matter of the Humanities. Occasion is taken to prescribe a composition exercise whenever a sound motive for writing is presented, and the scholars are allowed time to execute their work with care. Thus recently Class III. had a present of books for their Class Library; they were given large quarto paper with the school heading and asked to thank the donor, adding to their letters any information which they thought would interest her. A sample of these letters ran as follows:—

The Fielden School, Rusholme Place, Victoria Park,
 Manchester, 6. 6. 1912.

Dear Miss ———

Thank you very much for the nice Books you sent us. The day we broke up for the Whitsuntide holidays we made some seals in an open lesson they had Edward the Confessor on we have not used them yet. In my Garden I have scarlet-runners nasturtiums lettuce and radishes We are going to read the Books that you sent Now I think we shall like them I think that I must (st) stop now. With Love and Kisses from D M

Much better opportunities for real composition can be found in home-life, but we cannot ensure that parents will go to the trouble to exercise their children's powers; hence, unless the teacher can occasionally devise some plan of this kind, scholars may pass right through the years of school without practising what is the most congenial and important form of literary composition.

In many schools work much more developed than this is produced by a few scholars who are enterprising enough to plan a school magazine in manuscript or print. But only a few are

- reached by such efforts, and the school "essay" written to order
- on a prescribed theme is too conventional to reach the real.
 - purpose of composition. To achieve what the writer himself regards as literary effort it is essential that motive should somehow be forthcoming. When a teacher can so influence his scholars as to induce in them the desire to express themselves he has secured the one essential condition for success. This attained, all the minor matters, from punctuation and spelling to arrangement and balance, will follow. Fine art production cannot be "taught" in any event; but a modest power in expression can be achieved by most, if opportunity be afforded.

APPENDIX II.

A RECORD OF THREE MONTHS' WORK IN THE FIELDEN SCHOOL KINDERGARTEN WITH MONTESSORI (AND WITH OTHER) MATERIAL.

(Following on Chapter III., p. 46.)

Since September, 1912, we have set aside the first hour of the school-day in the Kindergarten (ages 4-6) for experimenting with apparatus either copied from Montessori models or designed on similar principles.

We have no scholars under four years of age, and this in itself makes our conclusions imperfect, since the child of two and three is more dependent upon æsthetic and motor experience than in later years. But at four and five, this dependence is still sufficiently marked to enable us to observe quite decisively the relation of cause and effect in certain directions. We shall first describe in succession what has happened, and then offer some general remarks.

The apparatus may be classified in three groups:—(a) *Educative toys*, of which the solid and the geometric "insets" are good examples.

(b) Apparatus and exercises to help the child to independence in personal habits, *e.g.*, the frames for tying and buttoning.

(c) Apparatus to facilitate learning the tools of culture, *viz.*, mathematics and language.

(d) *Educative Toys*. In placing an educative toy before a child the capital difficulty is to determine whether he "needs" it at the time. Very often he cannot find out until he is shown what to do with it; thus we let three boys have solid insets; they proved to be too old to care for them and presently wanted to "play shop" with them! But a younger child, less developed, is now happily occupied and is learning much from them.

The purpose of these toys must be clearly recognised. They are not designed, as are the Froebelian gifts, to enable the child to construct buildings or represent imagined forms, but the end of the "play" is achieved merely by sorting out, placing and replacing, in accordance with the conditions which the toy itself presents. The theory is that the child finds satisfaction (1) in achieving this end, (2) in repeating this process many times. The satisfaction is due to his desire for better mastery of the shape and size of things; apparatus specially selected is necessary because he cannot alone get hold of things which he can compare and arrange.

This view is not taken (at any rate by us) as covering the entire attitude of the child towards external objects. Very

often, as in the next type of activities which we discuss, his delight is found in the actual doing of enjoyable acts, with no distinct intellectual element; and at a younger age most English children are satisfied with play which is apparently aimless.

In addition to the insets we have tried with success a collection of seeds (Indian corn, sago, etc.) of about the same size but different in shape. These are thrown together in a bag and the child picks them out, sorting each kind of seed into a separate box—first with eyes open, afterwards blindfolded.

In watching the children it is very evident why Madame Montessori blindfolds the children so often—the sense of touch is seldom, under ordinary conditions, relied upon alone either by adults or children; the eyes help the fingers. Hence, we provide a situation where the child is compelled to achieve his result without the aid of eyesight. Here is a capital point where further investigation is required, for it is difficult to determine how far we moderns lose by being allowed to abandon so largely our resources in the sense of touch. The practical difficulties involved in blindfolding a child are real, but can be overcome. We are using linen eyecovers fastened with elastic. These can be easily washed. Each child has his own pair, which are marked with his name. They can be provided by older scholars as an easy exercise with scissors.

At this point let us note generally that the value of all this apparatus will be greatly enhanced if, whenever possible, it is made in the school. The handicraft classes of our schools, from ten years old and upwards, are sometimes at a loss to know how to employ their energies. Boys and girls will willingly make educative toys for their little brothers and sisters if provided with a model.

We have sought to find apparatus which isolates the sense of touch from that of sight without requiring the eyes to be covered, and the following has proved of interest (its value may be tested by adults as a "parlour game") :—A series of buttons or button-moulds, identical in shape and material but graded in size, are procured; the shops supply five sizes, but three are enough to begin with. Place half-a-dozen or more of each size in a small bag with a mouth large enough for the insertion of one hand. Put five little boxes (match-boxes are quite convenient) around the operator, each box to receive only one size of button. Place the boxes well apart from each other in a semi-circle. Then require the operator, holding the bag in one hand, to take out one button at a time with the other hand and place it in its right box. He feels each button while in the bag, but must not look at it when taken out, deciding which box claims it *before* he takes it out. Some operators do better with the left hand, others with the right. If button-moulds are used

these may be placed on small spikes, and the operator should then see at once if he has made an error. Two children enjoy playing this game together, one operating the other checking. With a little ingenuity puzzles of the jig-saw type could be devised which in the same way would compel the operator to rely on his fingers.

Thus, under the heading of Educative Toys we have used Montessori cylinders, geometrical and solid insets, beads and buttons in graded sizes placed in bags, and the coloured tablets of graded shades. These last have only been introduced recently, but already they are proving effective. It is clear that some young children enjoy colour, and can master discrimination of such exercise with ability at least equal to that of adults. It may or may not be true that this "toy" helps the child to become an artist. We are not concerned with such eventualities. We are satisfied when we find that it aids the development of the child at this stage by enlarging his experience in an important field. We think that other material may be devised in place of the silks more suitable for our smoky atmosphere, as well as less expensive than the tablets of Madame Montessori.

She has also a variety of apparatus for exercising discrimination in sound, smell and taste. We have imitated some of these and given them to the children; they are, however, more difficult to work, because they do not afford an easy means of occupying the child for any length of time with a purpose which he can achieve. All he can do, e.g., with a set of bottles containing coffee, sugar, salt, etc., appears to be to taste or smell them and mention their names. Perhaps in an orthodox Montessori school more than this is achieved, but *The Montessori Method* does not offer further guidance. This is interesting and useful so far as it goes, but a child cannot be left by himself to this exercise. Froebel recommended the use of objects for taste and smell which are extensively employed in Kindergartens in connection with action songs or games; but in such a social, collective "lesson" the opportunity for sense-discrimination is diminished, and this plan is in sharp contrast to the isolated, individualistic method of Madame Montessori. The best of the Montessori toys (from the point of view of her theory) are undoubtedly those which answer their own questions.

It must not be assumed that we are depreciating the Montessori apparatus by employing the epithet "toy"; it is the appropriate term since all the activities of this period of life are on the plane of play, and the toy is the apparatus of play. This gifted Italian lady is by no means the first who has sought

to devise educative toys, calculated to appeal to one or other of the senses. In Manchester, *e.g.*, forty years ago, a series of toys called *Mentics* were constructed and used in many families with the same end in view. We are making enquiries in the hope of recovering a set of them. Many toys are, of course, not educative, *i.e.*, they are not designed for anything beyond amusement. Some, of which Froebel's gifts or a Noah's Ark are good examples, allow scope for constructive imagination in contrast to the Montessori material, which can only achieve one definite end and have more of the nature of mechanical toys. Meanwhile the term "toy" may serve to cover all apparatus appropriate to the "nursery" stage of life.

(b) *Occupations Involving a Social Purpose.* Our most immediate and satisfactory experiment so far has been with the frames for tying ribbons, etc. Our children, like all others, are pulled in two directions: on the one hand they have instincts of self-assertion and independence; on the other hand the kindness of their elders, teachers as well as parents and sisters, is often overdone, so they are waited upon far beyond the age when they ought to be caring for themselves. Not only is moral development thereby arrested, but physical and mental development also, for the adjustments needed in tying a ribbon or buttoning a shoe are just as important as those involved in arranging a set of insects; indeed, it is obvious that they are more important. Now the genius of Madame Montessori is here shewn in meeting the child half-way. For example, in buttoning his own shoe he has to stoop and strain; very often he has to hurry; the adjustment of hands and fingers are thereby hindered. So we provide him with a row of buttons on which he can practise these adjustments at his leisure and with plenty of repetition. If to adult readers this appears to be a trivial matter, unworthy of scientific attention, we can only reply that the acquirement of moral habits is as necessary as the removal of adenoid growths. We have used seven "frames" similar to those described in *The Montessori Method*—leather and flannel buttoning, hooking, lacing, tying and "patent" fastening.¹ The benefits here were quickly realised by the children, and we were soon convinced that such apparatus enables them to become independent in dressing themselves much more quickly than by having dolls to dress. The little child is satisfied with the repetition of the same act twenty, forty, sixty times. He does not need the "purpose" of a doll's boot to button in order to secure this satisfaction; his muscles and nerves need to practise the adaptations of buttoning and

¹ We have found it helpful to add three frames, specially suitable for boys' clothing and boots.

unbuttoning in isolation from any other stimulus. When the adaptation is achieved then he reverts with joy to the practical situation presented by his own clothes and his own feet, and, if you let him, thereafter to the needs of any other child who has not learned this personal independence.

Another type of habits which is made prominent by Madame Montessori is concerned with cleaning and washing. In this field she has been anticipated by some of the followers of Froebel; thus, in the Sesame House School (St. John's Wood, London, N.W.), which carries out the methods of the Pestalozzi-Froebel Institut in Berlin, methods have long been in vogue which are similar to those described on pp. 122, 123 of *The Montessori Method* (see also p. 29 above). In the Fielden School we are now permitting our children, from the youngest age, to share in these domestic activities, and the principles discussed in Chapter III, p. 47, seem to apply equally to the younger as to the older children, when due allowance is made for their more limited range in capacity and endurance. Our experience, too, confirms the value to the carriage of the body and to general muscular control which comes from carrying basins of water, bowls, etc.

(c) *The Foundations of Language and of Mathematics.* It is too commonly the case that an inventor achieves public applause not because of his most valuable work, but from performances of inferior value which happen to please the uninstructed. We hear that the Syndic of Rome has encouraged the Montessori Method in the schools of that city because thereby a full year of school time can be saved. The children, he says, will now be able to leave school and go to work earlier than heretofore, because they will have fully mastered the three R's at ten or eleven, instead of at twelve or thirteen. In England the situation is regarded differently; teachers are by no means inclined to press letters and books on the child's attention at a precocious age. On the other hand normal children by the age of five have come to realise that the mysterious symbols of the alphabet possess meaning to their elders, and if their curiosity leads them to investigate this meaning there is no reason why they should be hindered from satisfying the instinct, in the form of congenial play.

We have not hesitated, therefore, to hand to our children of five the sandpaper and cardboard letters of the Montessori type and also sandpaper figures from 0 to 9; also the geometrical insets which give them motor experience of rectangular forms. To these we have added a set of cardboard dominoes, which have proved more helpful and attractive than any of the others,

although they may not be consistent with the Montessori pedagogy. The set

1	1	1	1	1	1	1	1	1
1	2	3	4	5	6	7	8	9

were placed in an envelope marked 1; the set

2	2	2
2	3	9

were put into a second envelope marked 2, and so on up to the

last envelope, which contains only one card domino

9
9

When the envelopes are emptied and their contents mixed together a couple of children find a most educative occupation in sorting them into the right envelopes. After two or three days' exercise the symbols become perfectly familiar, and much is learnt at the same time as to their relative values. Addition of the numbers was found quite easy when connected with the dominoes.

This occupation appeals solely to the eyes. Sand-paper models are more valuable for language than for number, because the forms of letters need more care in learning. Now it must not be assumed that, because the children in this way "learn their letters," they carry the analysis of words forward to the stage where they observe and reproduce entire words; on the contrary, the methods described above on p. 109 are by no means inconsistent with this preliminary motor-cum-visual perception of the shapes of the separate letters.

The success of our experiment here is undoubted. The older scholars of the Kindergarten who have "played" with this apparatus during November and December are already familiar with simple words and will be able next term to make a start with "real" reading and writing. But we do not propose on this account to hasten their proficiency in this art; they can take their time, and will probably find it more easy to spell correctly when the time comes in Classes I. and II. to compose sentences apart from the sight of a model. For it must be remembered that when a child has once mastered the mystery of language symbols he will make progress on his own account quite apart from the occupations of school, and this especially if he has not been discouraged in his ordinary life from exploration and adventure. Language is all about him in a modern town, and he will read the large lettered signs on shops before he tackles the pages of a book. The same is true of numbers. Our intention was merely to introduce the children to the symbols, but they themselves acquired an interest in addition, stimulated no

doubt by a little exercise in playing with bean bags, ninepins, etc. The result is that already the five-year-olds are able to write correctly on the blackboard the result of $2+7$, $9+5$, etc.

We may now discuss some of the principles at issue in these occupations.

1. *Freedom v. Discipline.* We cannot here attempt to examine the doctrine of "freedom" which *The Montessori Method* expounds, for it leads us directly to fundamental aims which government and people profess in establishing educational systems.¹ We think the author, in her desire to shew the difference between her system and the public system of Italy, exaggerates the amount of liberty which she permits to her children. They are evidently allowed a certain freedom of choice, day by day, between certain pieces of apparatus, but the "Directress" has a graded sequence in the apparatus extending over five years, and one must assume that her directions extend, if not to compulsion, at any rate to very strong suggestion in the case of a child who needs such stimulus. We mention this point, for it is one which will certainly prove embarrassing to English teachers who try to copy the Montessori System in detail. We have in England a type of child which probably does not present itself so commonly among the class of children described in that book, viz., the child of lethargic temperament, whose lethargy has been encouraged by the mistaken indulgence of parents, so that he is quite satisfied to sit half-an-hour playing with a frame or with seeds, but for the most part finding satisfaction in looking around, vaguely and aimlessly. Now to allow "freedom" to such passive, inert natures may be to check the possibilities of active progress in later years.

We take it rather that the freedom advocated on this system is (1) freedom from the class. The individual finds freedom and self-control by working alone or with one or two companions who choose to join him; thus he develops at his own pace. (2) Freedom to finish his allotted task at his own pace; in other words, the individual is permitted development in isolation.² No words can be too impressive to describe the importance of this reform. How far Froebel really meant the

¹ See p. 4 above.

² *The Montessori Method* (pp. 103-4) uses the term "isolation" in another sense as a mode of punishment: in solitary idleness. A child can enjoy and profit by occupation in isolation or detachment, without the feeling of loneliness. On p. 279 the term "isolation" is used by the translator in another connection—isolating the use of one sense, as an individual.

infant to have this freedom it is difficult to say,¹ but it is certain that in adapting the Kindergarten theory to "school" conditions most infant teachers have assumed that children must be "taught" simultaneously, and that the isolated, separated activity of the child can be sufficiently cared for away from school.

This leads to a question of organisation which we discuss below; meanwhile let us note the result of our own observation, since we permitted this freedom in the Fielden School Kindergarten. We find quite a striking change in the children's behaviour. Formerly they were permitted each morning a period of what was called "free play" during which they could romp about and enjoy themselves, but usually this period was merely an occasion for the flow of boisterous spirits; now each one goes at once to the apparatus cupboards, takes out the "toy" which is engaging him and starts to "work" on it. Although we speak of "work" to the child, these occupations are regarded as play, simply because he is let alone to play by himself, and to choose his plaything. The restless atmosphere of social excitement has disappeared and they evince no desire to have a period for "free play," i.e., romping. The children are quite as happy, but they are more self-controlled. Now, while the teacher thus becomes (as Madame Montessori so finely describes) a director and observer, detached from active interference, she is still in place as an elder friend to whom the child appeals for approval, sympathy and advice. For while this isolation is, as we believe, necessary, it does not thwart the social instincts which lead the child, *when he feels the need*, to turn to the teacher and also to his comrades. This last is equally important and should not be repressed. Thus E (aged five) one morning asks if she may go and help G (aged four), for "I'm sure he is not doing the dominoes right." The result was that G, after being helped for three-quarters of an hour by E, successfully managed to sort out the 3's and 5's into the envelopes. Thus the permission to choose freely results not merely in the isolated mastery of apparatus, but in a free choice as regards social co-operation.

2. *The Meaning of "Sense-Training."* Some of those who are writing on this Montessori System are falling into an error similar to that which beset the Sloyd pedagogy of thirty years ago with its jargon of faculty-psychology. It is supposed that there is some specific quality or power to be "cultivated by Montessori exercises, which will function in later life as power

¹In many of his writings it is clearly the single child playing alone or with the mother that he has in mind.

in the hands and finger tips. There may be real scientific foundation for this view, but if insisted upon it leads one astray, for it misses the real issue and exposes us to the very just criticism that many adults in modern times do not require to be expert in the finger tips, but to be able to use language and science. Hence it seems better not to speak of "training" at all, but to assert (what is patent to anyone who watches these infants for psychological purposes) that they are *learning their world* by means of direct motor and sensory experience. They, like ourselves, want to enlarge experience (compare p. 40 above) to discriminate, arrange, interpret their *cosmos*; and whereas in later years man achieves this by language and thought, the infant relies on direct sense-perception. Thus the employment of educative toys is justified, not as a preparation of muscle and nerve for future benefits, but as a means of living and developing wisely at the moment. The "world" which the infant has to master is concerned with the height, weight, texture, colour, shape of material objects; he discriminates and compares on the perceptual level. Failing ample opportunity for such employment during infancy he cannot with complete success achieve the higher level of mentality in later years. Let it be borne in mind that the modern child, especially in cities, with artificial light, artificial culture of all kinds, is deprived of much of the simple material, much of the reliance on tactile experience, which his predecessors found to hand in earlier times. Instead of promoting this normal development modern civilization, with its schooling, has tended to arrest it; thus the invention of educative toys is justified to redress the balance. Hence also the importance of grading the exercises (see *The Montessori Method*, Chapter XX.). Failure is sure to result if a teacher sets a child to work at a toy which is either too difficult or too easy for him. One morning, e.g., we gave the geometric cylinders to some older boys; in a few minutes they had fitted them into their places and then proceeded to play shop with them, as we have noted above.

3. *Organisation of the Child's Time-table.* Our experiment since September has satisfied us that in each of the types of activity mentioned above useful occupation can be afforded to children, i.e. (a) they can well spend time at least from the age of three on educative toys; (b) they can, and should, be engaged in domestic activities; (c) from the age of four or five they can engage on apparatus which has distinct relations to the acquirement of mathematics and language.

But we are now presented with time-table difficulties. A Montessori School in Italy appears to extend from 8 or 9 p.m.

on to 5 p.m., whereas an English Kindergarten stops at noon, and even the Elementary Infant School only affords some four and a half hours. Further, we are not likely in England, however enthusiastic we may become for the Montessori pedagogy, to drop collective teaching in the form of song, story, game and Nature study. It is difficult from *The Montessori Method* to make sure whether Madame Montessori would approve of any form of social, collective teaching for infants, but if she disapproves we are not prepared to follow her. We cordially admit the value (for moral as well as intellectual development) of the Montessori apparatus, but our children still wish to sing and play together, to hear a story and exchange ideas in company about the natural world, and to play with toys which give scope for constructive imagery. But the practical difficulty is at once presented—how to find time for these new occupations with Montessori apparatus and in domestic activities during the short school day. As regards the Infant School the difficulty is not so great, but in Kindergartens, where only a morning session is allowed, the problem seems insuperable. And it will prove to be so unless we recognise that the infant has his life to live in the afternoon as well as the morning, and that his elders at home are as interested in his welfare as is the professional teacher. This consideration is of special weight because the freedom and isolation required for success with these toys can be equally well secured at home as at school. Hence we anticipate that among English-speaking people (and, with these, German homes should be included), where family solicitudes and obligations are esteemed, the success of "Montessori" will depend partly upon co-operation between school and home. The teacher will begin to interest the child at school; then she will communicate with the parents and induce them to carry over the same occupations to the nursery, so that the child may continue his development for many hours in each week. We need not dwell upon the many benefits which will accrue to all the three parties concerned if this prove to be the outcome of the study of the Montessori pedagogics. Teachers and educationists often complain, sometimes with justice, of the indifference displayed by parents to the efforts of the school. This indifference, however, is not always so intended, but is rather a shrinking from intruding on the technicalities of our scholastic cult. In this case, however, there is no great difficulty or mystery; it only requires reasonable care and attention to see how this apparatus is employed and then to give direction as needed. Of course we do not for a moment deny that the best of skill is requisite for a proper grading of the toys so as to adapt them to each stage of development and to the distinctive power of each infant. It is

here that the advice of the expert teacher, who has a number of infants under observation, is invaluable. She allots some time each week to Montessori occupations, observing and grading the children; then, on the basis of her experience the folks at home can continue to educate the little ones, replacing the useless toys at present supplied from toy shops by material which is both attractive and educative. Thus, when teachers have secured the requisite skill, we anticipate that they will do much to guide parents in directing the play of little children with Montessori or similar material.

This co-operation can be extended yet further. We have recently (see note to p. 3 above) given our girls of 14 or 15 an opportunity of spending a morning with the little ones, to the benefit of both parties. There is no reason why boys and girls should wait till they become fathers and mothers before they take an interest in little children. Much is now being said as to the preparation of girls for domestic careers, and they are being provided in some schools with life-size baby dolls to wash and dress. It would appear more rational to let them actually help with the infants at school as well as at home. Thus, where an Infant Department makes too great a tax upon the energies of its teachers, why not permit three or four girls to come for a day in each week from Standard VII. and help to direct the little ones, both in the use of the educative toys and in the social activities? This would not be defended as a saving to the ratepayer's pocket, or as a return to discredited monitorial systems, but as a simple recognition of the practical sympathies and relationship that exist under natural conditions between elder and younger children.

4. It will be seen that our endeavour throughout this investigation has been to separate what is general and universal in Madame Montessori's work from what appears to us as specific and narrow. To carry out her "system" in detail demands, it would appear, a body of teachers trained exactly to copy her plans and reproduce her idiosyncrasies in detail. Now, while we should ourselves esteem it a great privilege if we had the opportunity of working for a time under her guidance, we are surely right in seeking to follow the spirit rather than the letter of her system. Our own freedom from pedagogic shibboleths compels us to be free in our criticism, and we feel sure that the breadth of her own conception will lead her to welcome liberty in her fellow-teachers no less than in children. Hence, finally, we shall hope to see these principles applied quite freely by teachers in planning many varieties of toys and apparatus. But it would seem, from what we read in the pedagogic press, as if every teacher or school authority will be expected to

procure a complete Montessori outfit (costing £10 or £16) before the principles of this new method can pretend to be put into practice. Now, if this is the case, a grave error will be committed; some of the apparatus will be found to be admissible, and this should be exactly copied; others, we are convinced, can be greatly improved. We have ourselves ventured to devise apparatus, and have mentioned above examples of two kinds which are not to be found in the Montessori repertoire at all. Furthermore, it is greatly to be desired, as we have pointed out above, that the schools should make their own apparatus. This resource is, of course, not always to hand, and some of the toys must certainly be provided by manufacturers and placed on the market.

Hence, in this, as in all other features of the education of infants, success will depend not upon the pedantic reproduction of devices, whether called Froebelian Gifts or Montessori Apparatus, but upon faithful study and observations of children, by teachers who combine a reverence for these great reformers with a spirit of freedom and independence.

For these reasons we greatly deprecate the mode in which the American "entrepreneurs" of the System are seeking to protect their rights. The firm in New York City called *The House of Childhood* issues a catalogue, which reads as follows:—

The Montessori Didactic Apparatus has been patented, and other applications are pending: Infringers and imitators will be vigorously prosecuted.

Warning.—The Montessori Didactic Apparatus is not a set of separable toys. It is a system for sense-training, and while the sequence is not dogmatic it should be presented to the child in a regular order. No real educational end will be attained by a random use of isolated parts. The materials are largely self-corrective, but not "auto-educational" in any sense, meaning that the system does not require careful teaching. These materials should not be purchased by anyone who does not intend a careful, intelligent use according to the principles of the Montessori Method. Any materials used in the right spirit are better than those used in the wrong spirit.

Now, it is quite right for an inventor to reap the fruits of experiment and labour extending over many years, and where a piece of apparatus or material can be properly protected by patent no one can object. But principles of development cannot be patented, and it is foolish to attempt to dissuade teachers from experiment, by "warning" them against freedom and selection from among the various toys in the Montessori

catalogue. In spite, therefore, of Madame Montessori's "request," as stated by these manufacturers, that "the apparatus be kept together as a complete method or system," we respectfully submit that the wiser course is to leave each piece of apparatus to justify itself, and, further, to permit room for adaptation and improvement. In countries such as England and America, where teachers are allowed an increasing measure of freedom and initiative, this is the only course that can hope for success. However generous Educational Authorities may prove to be in purchasing the complete outfit it is certain that teachers of experience will only employ so much as they find of service and the rest will lie in the cupboards. We venture to offer this note of warning in the interests of the system itself.

We have no desire to engage in the lively battle now proceeding between Montessorists and those who regard the System as an eccentric innovation or as an impertinent reflection upon the teaching now given in our Infant Schools. This controversy seems to us of quite minor importance; in other professions discoveries are constantly being reported from all parts of the world, and professional men are invited to investigate, to criticise, adopt or reject without regard to the personal prestige of earlier work. It is, for example, no disparagement to Froebel's reputation or to the English Infant School, to believe that in *The Montessori Method* there are new ideas which demand investigation. The inquiry which we here report is merely of a preliminary nature, and we present it, not as a final verdict of "yes" or "no," but as a modest example of the mode in which we are seeking to discharge our obligation as students of children, and in line with the other contributions which make up this volume. Without endorsing the excessive claims to magical results made by Madame Montessori's publishers in advertising *An Educational Wonder Work*¹ we are satisfied that important principles of infant development are being applied by this "reformer" with great skill, and that these merit both genuine respect and patient investigation.

Nor should we omit to point out that *The Montessori Method* is of real importance as a contribution to pedagogics quite apart from the system which it advocates. There are many passages of rare insight and feeling which display Madame Montessori as a thinker of the first rank, with a mastery not only of apparatus for infants, but of ideas and experiences ranging over the entire life of the young. From this point of view her work is worthy of being carefully studied

¹ See the pamphlet sold under this title (price 20 cents, *House of Childhood*, New York City).

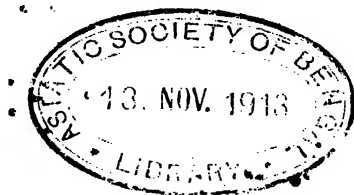
by all who are concerned with educational ideas, whether or no they are directly engaged with little children.

REFERENCES.—The Bureau of Education has just published a full bibliography of literature bearing on this subject (*Bulletin*, 1912, No. 17, Government Printing Office, Washington, U.S.A.). We need not give a list of the various papers, mainly of a controversial nature, written during the last twelve months on "Montessori," for none of them contain accounts of actual investigations with children. The only exception we have encountered is in *Primary Education*, Vol. xxi., No. 1 (Boston, U.S.A., January, 1913), an article by Miss L. Theresa Benson, entitled "An Experiment in Montessori Work." Her report affords useful comparison with our experiences. Miss T. L. Smith, *The Montessori System* (Harper Brothers, New York), records merely an experience with a single child. It is fair to add, that while these experiments reported from America are favourable, a committee of experts sent from Teachers' College, Columbia University, New York to Rome in order to investigate Madame Montessori's results on the spot have reported unfavourably; their criticism, emanating from so responsible a quarter, will be awaited with interest.

A Montessori Mother (London, 1913) can be highly recommended, as giving a very clear account, not only of the system, but of the philosophy, underlying it and its relation to the Kindergarten.

ADDENDUM.—*The Educational Times*, May, 1913, contains a further report on this investigation.

J. J. FINDLAY,
In collaboration with
Miss K. STEEL.



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